

HOW TO STUDY BIRDS

BY HERBERT K. JOB

2053.



A diamond-shaped library stamp with a thick black border. The text inside is centered and reads "LIBRARY University of California Irvine".

LIBRARY
University of
California
Irvine

QL
676
J622



Pair of adult Great Blue Herons on nest. (Telephoto.)

HOW TO STUDY BIRDS

A PRACTICAL GUIDE FOR AMATEUR
BIRD-LOVERS AND CAMERA-HUNTERS

BY

HERBERT KEIGHTLEY JOB

AUTHOR OF "THE SPORT OF BIRD-STUDY," "WILD WINGS,"
"AMONG THE WATER-FOWL"; MEMBER OF "THE
AMERICAN ORNITHOLOGISTS' UNION," ETC.

*ILLUSTRATED WITH PHOTOGRAPHS
FROM LIFE BY THE AUTHOR*



NEW YORK
OUTING PUBLISHING COMPANY
MCMX

COPYRIGHT, 1910, BY
OUTING PUBLISHING COMPANY

Entered at Stationers' Hall, London, England

All rights reserved

TO MY FRIENDS AND COMPANIONS IN BIRD-STUDY
AND
ALL THE GREAT AND GROWING ARMY OF BIRD-LOVERS

V

WITHDRAWN

WITHDRAWN

FOREWORD

The purpose of this book is to give, simply, clearly, and thoroughly, every possible suggestion and bit of practical information which may be useful to those who are beginning the fascinating study of birds in their native haunts.

Very many are undertaking it in these days — men who crave the excitement of the chase and yet dislike to kill, or who seek relaxation from the strain of business; women who are tired of being hothouse plants, or whose nerves are at the breaking-point from an unnatural sedentary life; boys and girls in the schools who are finding that delight in the animal creation does not cease when they are no longer little children; teachers who realize the importance and interest of the subject for the young, and desire to fit themselves to interest their pupils in the birds. But it is all new and perplexing, and there are a multitude of things they want to ask about, all sorts of inquiries as how to go to work to study the birds afield. It is hoped that this book placed in their hands may prove a ready friend to answer these questions to their satisfaction and to start them upon a happy career of outdoor delights among the wild birds.

Plenty of good books on ornithology have been written describing each species of bird as to its appearance and life-habits, but I am not aware that anyone has undertaken to bring together in fairly complete form all the information that is needed to enable the beginner to get the utmost pleasure and good out of the modern outdoor study of birds. Equipped with a handbook of birds for identifications, and with this HANDBOOK OF METHOD — which is an embodiment of the author's thirty years' experience afield — to show one HOW to study birds in life and to suggest the many possibilities of the subject, it is hoped that the beginner in the delightful pastime and avocation of outdoor bird-study may be thoroughly armed for the fray, and that many may be encouraged to study the birds who without such suggestion and aid might fail to become interested or hesitate to undertake it.

HERBERT K. JOB.

West Haven, Connecticut,

November, 1909.

TABLE OF CONTENTS

CHAPTER	PAGE
I. BEGINNINGS OF BIRD-STUDY	15
II. METHOD AND EQUIPMENT	25
III. IDENTIFYING BIRDS	37
IV. WHERE TO FIND BIRDS	49
V. LEARNING BIRDS' SONGS AND NOTES	63
VI. THE SPRING MIGRATION	75
VII. THE NESTING SEASON	87
VIII. NESTING EPISODES NEAR HOME	101
IX. THE AUTUMNAL FLIGHT	115
X. KNOWING THE WINTER BIRDS	127
XI. HOW TO FIND BIRDS OF PREY	141
XII. FOLLOWING THE WATER-BIRDS	155
XIII. CAMERA HUNTING AND OUTFIT	169
XIV. USING THE ORDINARY CAMERA	183
XV. SHOOTING WITH REFLECTING CAMERA	203
XVI. BIRD-LOVERS' VACATION EXPEDITIONS	215
XVII. BIRD-WORK FOR INDOORS	229
XVIII. SOCIAL BIRD-STUDY	241
XIX. BIRD-STUDY FOR SCHOOLS	251



ILLUSTRATIONS

Pair of adult Great Blue Herons on nest . . .	<i>Frontispiece</i>
	FACING PAGE
Snowy Egret on nest, showing aigrette plumes . . .	16
Blue-winged Warbler feeding young	20
Song Sparrow about to enter nest	20
Oven-Bird leaving nest	26
Mrs. Bob-White leaving nest	26
Northern Yellow-Throat, after feeding young	32
Ruby-Throated Hummer alighting on nest	32
Remarkably tame female Scarlet Tanager	40
Nest of Veery, showing how to photograph a nest	40
Male Rose-Breasted Grosbeak	50
"The best-known door-yard bird is doubtless the Robin"	50
Laughing Gulls on Breton Island Reservation, La.	56
Brown Thrasher attacking the camera man	64
Study of young Cedar-Birds	64
Bluebird entering nest to feed young	70
Female Redstart feeding young	70
Woodcock dabbling in margins	78
Woodcock running, showing "flag"	78
Nest of Blue-Winged Warbler	88
Nest of Northern Yellow-Throat	88

ILLUSTRATIONS

	FACING PAGE
Nighthawk leaving nest near foot of weed	94
Nighthawk nesting on low rock in open field	94
White-Eyed Vireo delivering a large contract	102
White-Eyed Vireo "frozen" at nest	102
Long-Billed Marsh Wren at nest	108
Virginia Rail on nest	108
Breeding Royal and Cabot's Terns, Louisiana Reservation .	116
Chickadee at lunch-counter	128
White-Breasted Nuthatch, attracted by suet	128
Entire Kingbird family at nest	132
Flock of Pine Grosbeaks near house	132
Young Broad-Winged Hawks	142
Great Horned Owl incubating	142
Young Red-Tailed Hawk	150
Sharp-Shinned Hawk	150
Breeding colony of Royal and Cabot's Terns, Louisiana .	158
Scoters, or "Sea-Coots," migrating	164
Turnstones	164
Nest of Whip-poor-will	184
Whip-poor-will on nest	184
Young Phoebe	188
Song Sparrow finally caught leaving nest	188
Broad-Winged Hawk entering nest	194
Kittiwake nesting on cliff, Great Bird Rock	204
Sooty Tern incubating, Florida Keys	204
Bittern on the beach assuming the hiding pose	210
Bittern on nest defying the photographer	210

ILLUSTRATIONS

	FACING PAGE
Greater Shearwater and Wilson's Petrels	218
Turnstones and Sandpipers on sandy beach	218
Home scene in rookery of Black-Crowned Night Herons .	222
View in Great Blue Heron colony	222
Young Cooper's Hawk, just out of nest	234
Pet Sparrow Hawk, eating dinner	242
Louisiana Heron at nest	242
Flicker near low nest-hole by road	254
Industrious Downy Woodpecker at work	254

HOW TO STUDY BIRDS

CHAPTER I

BEGINNINGS OF BIRD STUDY

ONE auspicious day in June I discovered a hummingbird's nest. I was a small boy, and lived in a suburb of Boston called Roxbury, near the edge of Brookline, on a fine old colonial estate, where the new Harvard Medical School buildings now stand. There were six acres of lawn, garden, shrubbery, and orchard, overarched by great elms and other shade trees. On one side of the house was a row of alternate Norway spruce and larch trees. A tiny hummingbird had been visiting the flowers about the house, and one day I saw her fly to her nest out near the end of one of the lower branches of the first larch tree. There were young in it at this particular time, but within a few days they had departed, and I brought a step-ladder and took down the nest. Never can I forget my feelings of wonder and admiration as I gazed upon the exquisite little cup built of silky fibers, coated with lichens. It was a revelation of loveliness which laid

strong hold upon my sensibilities, giving me a distinct impetus from which I never recovered. This is the earliest incident about a bird outdoors of which I have any recollection.

By another process I was being prepared to entertain such interests. In our home we were so fortunate as to have a set of that great work, Audubon's "Birds of America," the original octavo edition, in seven volumes, with a colored plate of each species of bird. These pictures absolutely fascinated me with a peculiar witchery which I cannot describe, but which was simply irresistible. In time I came to have the feeling that I must find these birds for myself. And when I found one or another which I had been studying from the book, and for the first time was actually face to face with it in real life, there came over me a feeling of unutterable rapture.

At the age of twelve there began another development. I went that summer on a visit to a family in the country in which there was a boy of thirteen who had begun to collect and "stuff" birds. His process was one of "curing." He removed the "insides," filled the cavity, throat, and mouth with arsenic and cotton, and mounted the bird with wires thrust through its anatomy. The array of shriveled mummies looked sorry enough, yet I took to it like a duck to the water. When I returned home there was no peace until I had a small single-barreled shotgun. During the first week I came within an ace of blowing off my brother's feet, and narrow escapes fol-



Snowy Egret on nest, showing aigrette plumes. This is when plume-hunters shoot them, leaving young to starve.

lowed in rapid succession. It is wonderful that I am alive to tell the tale.

Before long I learned how to skin birds, and so gave up the mummy process. The first specimen I tackled had no feathers on it when I got through, but I persevered. My parents, however, were averse to the use of arsenic, so I bought a certain naturalist's "dermal preservative," and in time built up quite a collection. One day I noticed that a specimen looked somewhat awry and undertook to smooth it. The result was that almost every feather dropped off at the first touch. The *dermestes larvae* had been busy and had riddled every skin "preserved" with the "insect-food." The older and less skilled creations which had been treated with arsenic were intact.

The question is often asked whether interest in birds can be aroused and maintained without killing and collecting. The best answer is simply one of fact, that to-day there are thousands of bird-students, true enthusiasts, who never kill a bird or rob a nest. In these days there are very many interesting, inspiring books about birds, with good illustrations, numerous collections of birds in museums, and many fellow bird-lovers with whom to associate. Hunting with the camera satisfies the natural desire for possessing and acquiring, upon which the almost universal collecting instinct is based.

Had these things been in my boyhood as they are now, I am sure that I could have learned the birds and enjoyed myself just as much by the modern

methods which I shall describe. While it is true that the science of ornithology could not have existed without the collecting of specimens by naturalists, it does not require killing by all or many who engage in it, for otherwise women and girls would be largely debarred, and it would be wrong to popularize birds as is now being done, for it would simply mean their extermination. Let a few scientists attend to the technical side of ornithology, and the museums prepare the necessary specimens, while the great mass of bird-lovers reap the fruit of their labors.

To give an idea of how intense was the fascination of birds over me in those early days, suggesting as well how others feel, I will mention a few incidents of that period. I recall one morning in May, rising very early indeed and walking some five miles out into the country, reaching my beloved haunts when it was so dark that I sat on a fence waiting for the birds to awaken and for light to make it possible to see them. Another time I gave up my Thanksgiving dinner to spend the whole day tramping the beaches at Scituate, watching the sea-birds, particularly the loons and marine ducks diving through the breakers. My Thanksgiving feast consisted of two sandwiches, — and the birds.

On another occasion, in early May, to watch the migration of the shore-birds, being unable to secure a companion, I betook myself to the Marshfield salt marshes, and slept alone in a Humane Society shanty back of the beach. I had no covering, and was so

cold that I was driven out on the beach at 1 A.M. to collect, by moonlight, not owls, but fire-wood. One Saturday, in winter, I was booked for an all-day's tramp. I had been feeling unwell and strangely inactive, and when I started it seemed wonderfully hard to walk, but I thought the lethargy would be forgotten when I saw the birds. Finally, about eight miles from home, I laid down on a snow-bank almost exhausted. It was off from any line of transportation, so somehow or other I managed to drag myself home. The doctor was at once summoned and found it a severe case of measles. It was weeks before I saw the birds again.

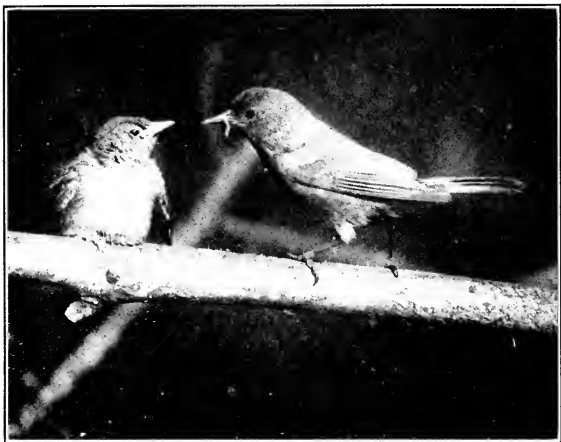
This is the sort of spirit which is animating thousands of people in these days who are interested, or becoming interested, in birds; not because bird-study is a fad, but because they find real pleasure in it. There is no question but that the birds as a class have peculiar elements of popularity. They are living and animated, beautiful in form and color, with powers of flight and song, not dangerous, of convenient size, and, as yet, sufficiently numerous to be found without too great difficulty.

The last statement is not true, in most sections of the country, with mammals. There are but few species to be found, and nearly all of these are scarce, shy, and mostly nocturnal, so that to specialize in their study would be too discouraging to be popular. Most people cannot enjoy insects and reptiles, and fish are more easily hooked than studied. Botany

and geology are delightful, and many bird-lovers are versed in these also, yet there is nothing so interesting as life. I do not wonder that I was fascinated by the birds, and that it has become the most popular branch of nature-study.

Indeed those who acquire this taste and interest are to be congratulated. One misses a great deal who does not have some outdoor interest as a means to health, vigor, and relaxation. It is well not only to dabble a little with birds, but to gain sufficient grip on the subject to make it a matter of life-long interest. Even if unable to keep up active field-work, as the cares of life increase, one can always dip into it at any time again, during vacations and holidays. I have seen this illustrated many a time by busy men who were interested in birds during boyhood and have never completely lost their interest.

The beginning of bird-study is a critical time, the period of greatest "mortality," as with all infancy. A good many try it a little, become discouraged over the difficulties, and drop out. But if one can only persevere through the early stages, there is a wealth of enjoyment ahead. In most cases, as it was in my own, the awakening of interest in birds is a gradual process. One is impressed with some incident in bird-life and begins to notice things which never before had won attention. Some friend, fond of birds, inveigles one into an occasional jaunt afield. The first thing the beginner knows, he or she has caught



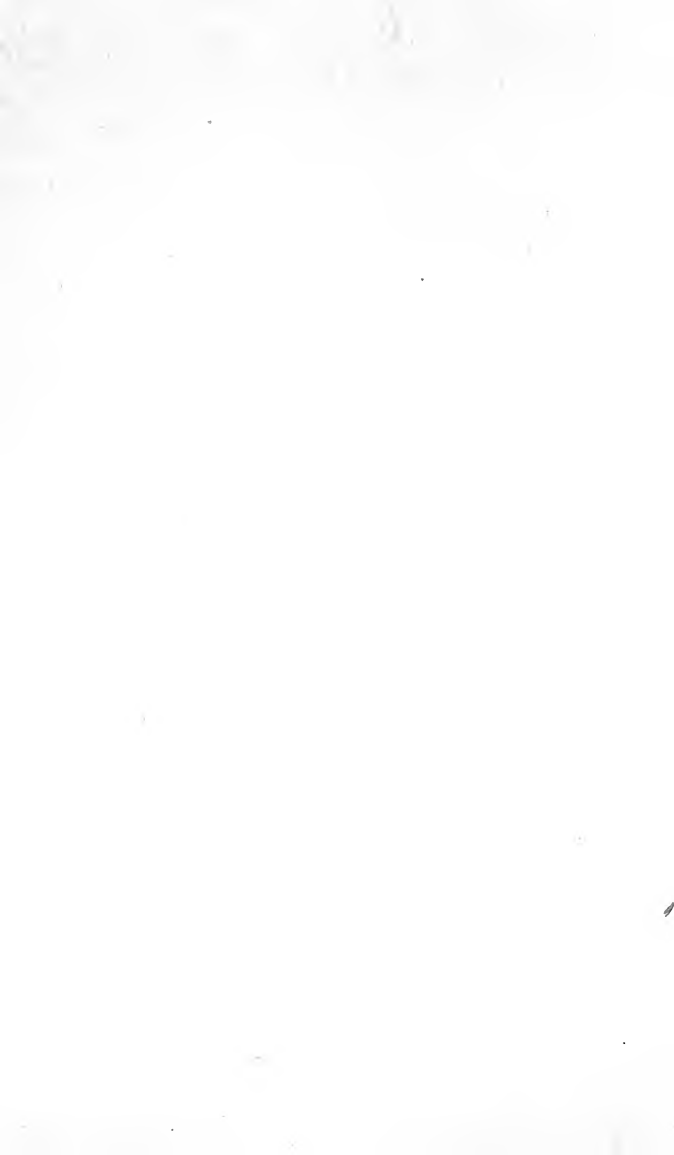
Blue-winged Warbler feeding young, showing posing of young for feeding picture.

—pp. 191-2



Song Sparrow about to enter nest.

—p. 105



the fever and becomes a devotee of the delightful pastime-study.

The present widespread interest in birds has aroused strong demand for their adequate protection and produced such organized efforts as the Bureau of Biological Survey, the Audubon Society, game protective associations, and a flood of splendid literature. It has become distinctly unpopular to kill wild birds, except edible birds for food, and that in great moderation. A multitude of people enjoy the live bird in the open for its own sake, for its esthetic value, and demand that there shall be birds to enjoy.

I heard this aspect of the subject forcibly presented at a legislative hearing by a high school principal. He told how his pupils, many of them, found great delight through the birds. In winter they enjoyed the gulls and ducks about the docks and bays, and spring brought a panorama of new wonders. They watched birds, laughed over their amusing ways, and made them a live topic of thought and conversation. The gunners were trying to repeal the "Model Law," so as to get a longer season for killing.

"Gentlemen," exclaimed the teacher, "I want you to realize that we bird-lovers claim just as much right to the birds as the gunners. There are more of us, and we get as much profit and pleasure from the birds in our way as the hunters do in theirs. We insist upon our right to have and enjoy wild birds

about us, and we shall feel wronged and outraged if our rights are not respected."

There may be some ignorant persons who sneer at such a thing as esthetic value, yet it is very real. The price that a house will bring depends a good deal upon how it is painted, and the effect of the bird upon the character and achievement of the young may be very great. Pleasure is an asset that must be reckoned with, and the birds give pleasure to a large number of people. They are a diversion, a solace, a rest, an antidote for the strain and stress of life, besides being of absolute necessity to agriculture, and thus essential to the very existence of the human race on earth. We do well to demand their adequate protection and to go out ourselves into the open to study them and to add species after species to the list of our circle of friends.

METHOD AND EQUIPMENT



CHAPTER II

METHOD AND EQUIPMENT

THERE is no one correct "method" in bird-study, any more than there is in learning to play the piano. Our object is to be able to recognize the birds when we see them, to become as familiar as possible with their habits, haunts, and seasons, to find out what and how many species are to be found in a region or locality, and perhaps take photographs of them. So long as we are able to accomplish these results, it makes little difference how we do it; there is no compulsory order or exact program. Nevertheless there are things which sooner or later must be done and must be learned in some way. Suggestions will facilitate progress, and, by avoiding waste of time and through securing greater efficiency from the first, the student will advance more rapidly and avoid becoming discouraged and abandoning the attempt to know the birds.

At the outset, in undertaking to study birds, it will be of great help to have some intelligent idea of the classes or types of birds with which we may become acquainted. Most people know a sparrow, a hawk,

or a duck when they see it. There are various kinds or species of sparrows, hawks, and ducks, but the several species in each of these groups have "a family likeness," certain general characteristics in common. Now there are not so many of these groups but that one can give a distinct idea of each without too great effort. Then, when a bird is clearly seen, one will have a pretty good idea as to where it belongs, and will only have to compare descriptions of a few species to find the right one.

There is a great difference in the state of mind of the person equipped with this knowledge who tries to identify birds and that of another who encounters the birds afield without it. I recall most vividly my first meeting, when a boy, with a certain common bird, and how utterly puzzled I was. One day in late autumn, as I passed through a grove in the suburbs of Boston, I came close upon a tiny bird with a small, rather sharp bill, black crown and throat, gray back, and white underparts. It was busily examining the ends of the branches, sometimes hanging head down, often uttering a series of animated notes.

I had not the remotest idea what the bird could be. Never had I seen anything like it. Perhaps it was a new species, that wonder which beginners sometimes hope to find in the most thoroughly explored regions! At home I had a great time searching the bird-books from cover to cover. At last, slowly and painfully, I became convinced that it was only a common chickadee! Had I spent a little time before in

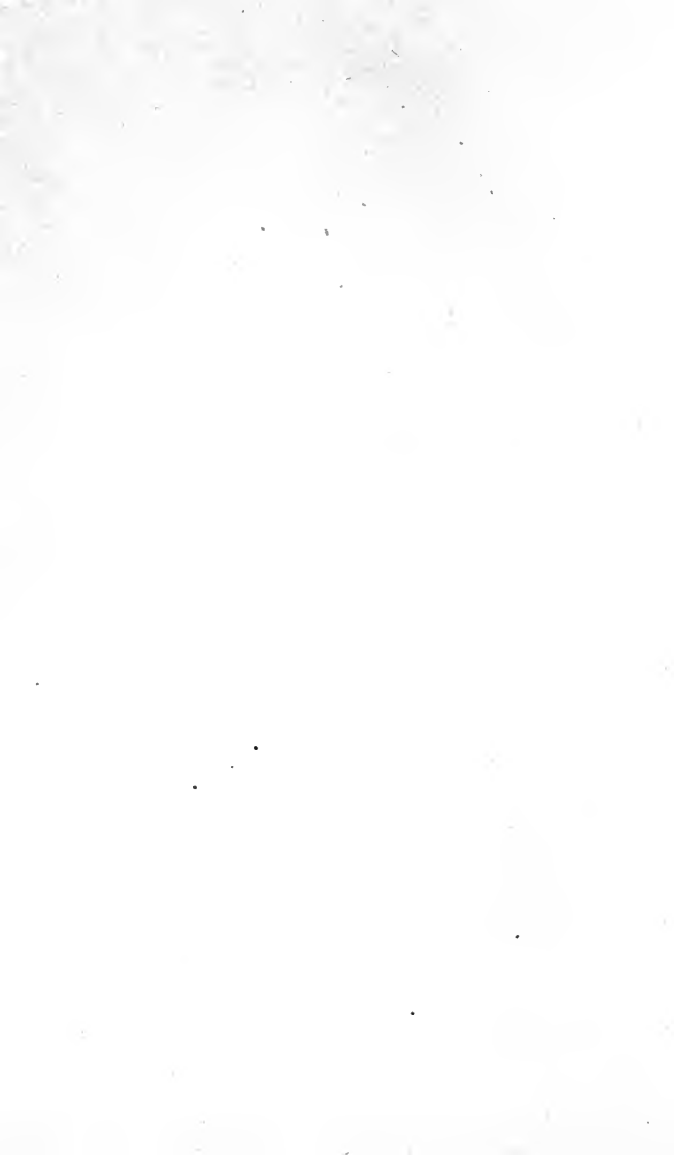


Oven-Bird leaving nest.

—pp. 103-4



Mrs. Bob-White leaving nest.



a "bird's-eye view" I should have known it could not have been anything else than a titmouse or nuthatch, unless possibly a warbler. Here is another case when, after taking the bird's-eye view, an identification was comparatively easy. Along a roadside, in some choke-cherry shrubbery I saw a bird about the size of a bluebird, with a rather sharp bill and of a general olive and yellowish hue with a black patch on the throat. I knew at once it must be some sort of an oriole. It was not the Baltimore, and the orchard oriole was the only other kind known to occur in New England. But I had never seen a female orchard oriole with a black throat. So, what could it be but some rare tropical species which had strayed up there! An excited looking up of the orchard oriole showed that this was the plumage of the young male in the second year. But for my having in mind the general characteristics of the oriole group, it would have been quite a problem to trace this out.

The best course for beginning to become familiar with these groups is to find out in the bird-books what are the principal groups represented in the region where one lives. Then, if possible, go to a museum and examine a few of the species in each group. In this way one will get a very vivid idea of family resemblances, and it will be a mighty help afield. If there is no museum near, make the same study from pictures of birds. In case there are none at home, the public library may help out.

In order to be properly equipped for good work

it is necessary to secure certain pieces of apparatus,— notably a field glass and a handbook of birds. As to the first, I would state emphatically that it is not at all necessary to purchase anything expensive or cumbersome. An ordinary opera glass will do very well. Combine the qualities of a reasonably high power and a light weight. It does not necessarily follow that a glass is so very “strong” because it is heavy. What one wants in a glass is mainly to be able to see birds clearly enough to identify them, and a good ordinary glass of fair size, the best one can get for a moderate expenditure, will suffice for all-round work. Such a glass is as good as any other for work in a swamp, shrubbery, or foliage, where the birds, to be seen at all, are encountered at close range.

Under conditions of this sort a very high-power glass is not only unnecessary, but distinctly not so good, as it is very hard to get the bird in the field of vision and in focus. With the ordinary opera glass one can pick up a bird in the thicket almost instantly, whereas with the other it becomes a vexatious hunt, and by the time one has got the range, the bird may very likely have departed.

For work at long range in the open, an 8-power binocular is a wonderful aid. With one of these I remember watching a flock of those exceedingly wary birds, great black-backed gulls. They were at the water's edge on a very wide beach at low tide, and I was peering over the sand-dunes, probably three hundred yards away. They did not see me, and were

quietly resting and preening their feathers. The glass brought them so "near" to me that I could see when one opened its bill, and clearly distinguished every motion.

In an open place one can watch a warbler in the top of a tall tree, and see every detail of form and color from such a distance that without a glass the bird would be practically invisible. There is a hawk watching for prey, outlined against the sky on the bare limb of a tree far across the fields. It would not allow us to approach within a hundred and fifty yards, but with the glass we can tell what it is almost as well as though we could walk right up to it. One is fortunate to have a glass of this sort, especially as the glass is light and compact. But if not, there is no need to be discouraged, for some of the very best ornithologists get along with an ordinary glass, and for work in thick places one will do better with the latter than with the former.

As to the handbook of ornithology, one that is small and concise, having condensed descriptions which make clear the distinguishing characteristics of the species, is the best one for the beginner. These also will have a brief sketch of each bird's habits, with condensed information about its nesting, notes, and other items. Frank M. Chapman's "Handbook of Birds of Eastern North America" is the best general one for that territory, and Mrs. Florence Merriam Bailey's "Handbook of Western Birds" for the West. Ralph Hoffman's Handbook is excellent for

the New England and Middle States. These books contain convenient "keys" for the identification of birds. Sufficient explanation is given with each key as to its use.

The matter of making records of observations afield is a very important element to add zest and definiteness to the study of birds. This is imperative even if the study is solely for recreation. Merely to see and identify birds is very pleasant for a time, but it is so indefinite that one is liable to weary of it, or merely to dabble in it occasionally in a languid sort of way. But if things are put down in black and white one has something to show, something permanent to remember. Besides, the future use of the record is part of the game, as we shall see presently.

One should carry afield on every jaunt a small, ordinary pocket note-book and pencil. Write first the date, weather, and the general locality. Then, as the first individual of each species is seen, however common, put down the name at once, if it is recognized. It is part of the sport to find as many birds as possible in a day and to compare the list with that of others who may have gone afield on the same day, or the same week. Not only is the total number a matter of interest, but also the varieties seen.

A friendly rival might, for example, see exactly the same number of species that we did, and yet one greatly surpass the other in the real value and interest of the list by the discovery of rare or uncommon kinds. It is usually more of an achievement, say, to

find an owl than a robin. On a day in May, during a great "wave" of migrating warblers, one very rare species positively identified may be a greater "strike" than the recording of twenty other more common ones. It will be of great interest subsequently to look over these daily records and see how the abundance of birds in general varies, how the personnel of the species changes from time to time, and when this or that one is first or last seen. As each year passes, it is of absorbing interest to compare the recent notes with those of the corresponding time the year previous, or of a succession of years.

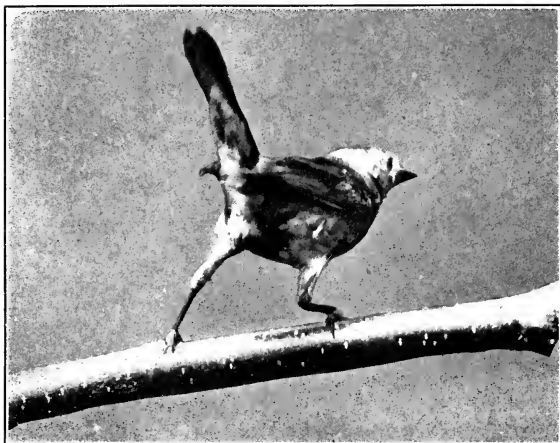
The mere recording of each species seen is not enough. As birds of the same species recur, one may add marks opposite the name, up to the point where it is evident that this or that is abundant. Record should be made, in just a few "catch-words," of all items of interest connected with birds' habits. It may prove that some little point, supposed to be of no value, is really of great interest, and worthy of wide publicity. If the nest of a bird is found, brief record should be made of situation, number, and condition of eggs or young, the material of the nest, the actions of parents, and any other points of interest. Casual notes should be made of the progress of the season, which will prove interesting and valuable for comparison year by year,—the first and last snow and frost, the first hepatica or blood-root, great storms, and any unusual conditions.

There are some quite elaborately prepared field-

books, with spaces ruled off for all sorts of things, which one may secure, if desired, but unless one is going very extensively into migration records and the like, the common manila-covered "order-book" answers every purpose. A very neat way is to have a small black cloth-bound cover to hold perforated pages. These can be taken out, put on file, and later on tied or bound together, others being inserted as required.

Besides the field notes, it is an excellent thing to keep a journal of observations and experiences, written up at home, as an amplification of the hasty jottings of the field-notes. This is not essential, in a way. Adults who lead busy lives and can only snatch brief or infrequent intervals for jaunts in the glorious open, and who do not intend to go into the subject very earnestly, of course may feel themselves excused from this. At the same time, it is a delightful thing to be able to read over one's past experiences in years to come. But for the young I earnestly recommend the keeping of a journal. Besides being a great source of pleasure afterwards, it furnishes a constant and fruitful field for facility in the expression of ideas, which may lead on to more important things. This book, for instance, is a direct outcome of that habit.

A most satisfying and useful method of bird study is along the line of special research. For this one may select a species as such, or a phase of its life, as its nesting habits. Or else some general topic may



Northern Yellow-Throat, after feeding young. "Going some."



Ruby-Throated Hummer alighting on nest. The ordinary shutter is too slow for wings.

be chosen,—how birds start on migration, where they spend the night, bird psychology, etc. In such ways earnest workers may contribute to science and gain recognition therein.

A few suggestions as to clothing may not be amiss, though in bird-study there are no fashions or conventions along this line to be respected. The most useful of all articles I find to be a pair of long rubber boots. Those that merely reach to the knees will neither keep one dry in a marsh, nor in long grass or snow. Clothing had better be of subdued hues, to blend inconspicuously with the outdoor surroundings; browns or grays are best. Even in severe winter weather it is well not to be impeded with a long or heavy overcoat. It must be pretty cold to chill one exercising in a sweater.

A suit and cap of corduroy are well-nigh proof against cold, but they are too hot for use in the warmer seasons. Then one might use something of light canvas, though it is exactly as well to wear out one's old clothes. A light rain-proof coat is also needful. On long drives or extended trips I always plan to carry one. There are times when most of us "bird-cranks" wish to be out in the rain, and equipped with waterproof coat, hat and boots, it is real fun to defy the elements. Thus fitted out I have had glorious times tramping the sea-beaches in the northeast hurricanes or made splendid finds of nests in wet grass or rushes when the birds were sitting close.

IDENTIFYING BIRDS

CHAPTER III

IDENTIFYING BIRDS

TO many uninitiated persons the difficulties of identifying and recognizing birds seem insurmountable. "All I can see," said someone to me, "is a speck, and then a streak of something flying, and it is gone. They all look alike to me." That is about the way I talked to a fisherman with whom I was out thirty miles off Cape Cod, having great times catching big codfish, haddock, hake, and halibut, and watching Mother Carey's chickens and shearwaters and the school of finback whales which were spouting close around us.

His eyes, though, were more for vessels than for birds. The fleet of "shore" fishermen were scattered about for miles over the "Rocky Grounds," in about eighteen fathoms of water. Various craft were dimly in sight — or out of sight to me — miles off in the dim haze.

"Hullo, if there ain't Rufe Nickerson 'way down to the sou'west!" he would ejaculate. "He's got a good breeze from the no'th-east. And there's Cy Eldredge hove to, 'way inshore, getting some fish, too!"

By dint of straining my eyes and my imagination, I was able, after quite a while, to say, truthfully, that I saw them, or rather some boats. I should not have noticed them unless I had been told they were there, but for the life of me I couldn't have told whether it was Rufe or Cy, or Patrick or Vincenzo.

"I don't see how you can tell," I said. He laughed, and replied that it was as plain as day. That one had a new mainsail, the other's jib set flat, and there were a lot of other points too numerous to mention and too inconspicuous to attract the notice of a stranger, even when they were along-side, to say nothing of miles away and hull down.

The fact was that the fisherman's eyes were trained to that sort of thing, and it was perfectly distinct to him, though an utter bewilderment to the novice. So it is, in a measure, with the birds. Some of them we encounter at close range, and they are so considerate as to delay long enough to give us a good look. But others seem constitutionally unable to "be aisy," or are exceedingly shy, and give the observer but a fleeting glimpse. The latter may be quite enough if the bird has any distinguishing peculiarity. If not, it will be evident to the trained observer to what family the bird belongs, if he has had any sort of fair though fleeting glance at it. One can in time come to know so well the "cut of the jib" or the "set of the sail" that it is not necessary to stare into the eyes ten feet away to know whether it is Cy or Rufe.

Size, form and manner of flight tell a great deal,

even before we can distinguish color. The use of their wings by birds in flight varies very greatly. The chimney swift moves its wings quite rapidly and continuously, with intervals of gliding, and they are shaped long and narrow throughout. The little hummer has long narrow wings, but they are very tiny and move so fast as to blur to the sight. The swallow's wings are pointed and broader at the base than the swift's, nor do they move quite so fast or so irregularly. The nighthawk, "hawking" about overhead, is larger, and the long wings have a noticeable bend, with a white bar on each. The meadowlark, with short, rounded wings, flutters and sails alternately. The kingbird poises with rapidly quivering, extended wings, as does the kingfisher, but when the latter starts on, it proceeds with rather slower and more decisive flappings. Most sparrows and finches have a quick, continuous flight, with rapid wing-beats in succession and short pauses, but some, like the goldfinch, go by jerks, rising and falling in deep undulations, usually calling as they fly, as though each jerk forced air through the larynx. The woodpeckers also have a wavy flight, but they are larger, and can be readily distinguished.

The warblers are slender little birds with a sort of flickering flight. The cuckoos have a rather steady, gliding progression, and a very noticeable length of tail. The blue jay's long tail attracts notice, and he progresses by a regular series of flappings. His relative, the crow, goes by a slow, regular series of sepa-

rate wing-beats, but sometimes he sails, and for the moment would make one think he was a hawk, till he starts on again.

Birds likewise reveal themselves through positions in standing, and in their paces or other motions. Flycatchers and bluebirds stand very erect, as do thrushes and the cedar waxwing. But the flycatcher soon reveals himself by darting out after an insect. The thrush stands still for quite a while,—in the woods, unless it be a robin,—while the bluebird will more likely take an apple tree, fence, or wire, and he is smaller than the robin. The waxwing has a pronounced crest and usually goes in flocks. The spry movements in the foliage will distinguish a warbler from the sedate vireo.

The blackbird walks, as do the larks, starlings, pipits, oven-birds, and water thrushes, while the robin, sparrows, and others, usually hop. The fox sparrow, the thrasher and the chewink scratch away among the dead leaves, but the variegated chewink can never be mistaken for the other brown bird, nor could the fox sparrow for the big thrasher, even if he had not left for the north before the thrasher arrives. The birds that climb thereby distinguish themselves from all others. One will know that the nuthatch is not a woodpecker when he persists in running down-hill on the tree-trunk. The slender brown creeper, climbing in upward spirals, appears different from the robust woodpecker, and the black and white creeper or warbler will not be taken for the brown creeper be-



Remarkably tame female Scarlet Tanager hopping back to her nest after having been removed by the photographer.

—p. 111



Nest of Veery, showing how to photograph a nest.

—pp. 185-187



cause it is so distinctly black and white, as well as because it leaves the trunk to investigate the various branches.

As I have already said, it will be of great help to learn the principal groups and families of birds in a general way, and their peculiarities. But when it comes to singling out the particular bird, especially members of the finch or warbler families, and tracing them up, there is really no royal road, save the good old-fashioned way of active following up, careful and alert, noting characteristics of form, color, and marking, and looking it up in the book,—unless one is fortunate enough to have experienced friends to whom, or with whom, one may go. Though bird-study and a good many other things in these days have their difficulties reduced to the lowest terms, we have not reached the epoch yet when everything is done for us.

I am reminded of the remark of a friend of mine, an expert ornithologist. He was kindly undertaking to show me, in a region new to me, the haunts of certain not common warblers, with a view of finding their nests. Arriving in a large area of small scrubby growth bordering some woods, we heard the desired birds sing, and saw them.

“Here they are,” said he, “and the only way I know of to find their nests is to *work*. They may be nesting in or under any one of these million or so of bushes and weed-clumps, and if you wish to find them you’ve got to look in each place till you strike

what you are after." This is over against the idea which some beginners have that an "expert" with birds can do or see anything he wants.

Remember that bird-study at its best, followed thoroughly, is an active, manly sport,—or else it would not appeal to vigorous youth. So don't let us hear any weak repinings about the bird not waiting to give you a good look. So much the worse for you, if you missed it; you will have to try again. Maybe another time you will have better luck. The bird may happen to come your way just right. Or, at the first meeting, you may have blundered by being too precipitate or making too much noise. Some birds are shy and always hard to approach. Get your ingenuity unlimbered and try some cunning scheme. If the bird will not let you come to it, try to make it come to you. One way is to hide or keep still and let it come your way, or else have someone go around and drive it toward you.

And do not, I pray, complain that you cannot get where the bird is,—that is a pitiable confession of weakness, unless excused by a real physical disability! If the fastness be a morass, get on the rubber boots and go in, even if, perchance, a slip should make it "all over." Never mind, there are dry clothes at home, soap is cheap, and you will not catch cold while exercising. If by any chance you are of the dignified kind, honestly, a tumble into a mud-hole would do a world of good.

The various haps and mishaps are part of the fun,

all helping to make up the harmless and exciting game. Only persist, and you will be climbing by leaps and bounds into intimacy with the birds, and ere you know it you will be numbered among the expert and knowing. I know ladies who are very excellent ornithologists, and can recognize birds accurately as fast as they come into sight or hearing. Very many ladies and girls are studying birds, and it is as good for them as for men.

In meeting and getting a good look at an unfamiliar bird, it is an excellent plan to write in the field note-book at once a brief description of the main characteristics of the bird so as to have accurate data for looking it up at home. The memory cannot always be trusted, and it is surprising how much one can forget or overlook. Unless things are written down, there will almost surely be various points, in referring to descriptions, about which one is hazy. Moreover, the very effort of writing sharpens the power of observation and makes the description the more complete. With a good description in hand, one will have data to follow out the arrangements in the keys in the works on ornithology. Some keys are based primarily on coloration, so the task will be easier in cases where the bird has pronounced colors or markings.

Unfortunately not all birds are thus distinct. Especially in the cases of the young, some species are very much alike. This is notably true of the sparrows. Even though the parents may have no mark-

ings on the under-parts, it is characteristic of young sparrows to have them. Most of them lack the distinctive markings of their parents, and seem to be just a dull, nondescript mixture of varying dull browns, apparently much the same in one as in the other. This is particularly true of them in summer, but the atmosphere of doubt tends to clear as they pass from their "juvenal" plumage to the next more mature.

The young of warblers, too, are often puzzling. Fortunately some have the distinctive characters of the species, such as the general yellow hue of the yellow warbler, or the yellow on the tail of the female redstart. But the young of the common blackpoll and of the rarer bay-breast are so very similar that they can hardly be told apart unless the bird is shot and in the hand, and none too easily even then. In such a case we may simply accept the limitations of bird-study without a gun. It is no great matter if we fail to "round up" every bird that we see. Even the collector cannot get every specimen which he tries to capture.

The few who make scientific research their life-work can secure collecting permits from the State. As it is, though we might identify more birds by shooting them, most of us would lose more than we should gain by so doing. For myself, to shoot every blackpoll I might meet on a fine September day in the woods to prove that there was a bay-breast among them would not only be valueless, but utterly re-

pulsive to my better feelings, spoiling the day and the trip.

This will suggest limitations also as to the matter of scientific record. A "form" or "sub-species" could hardly be distinguished without collecting the bird, and, even then, in some cases, "examining it in a correct northern light,"—as they put it! Without the gun we cannot expect to distinguish the so-called bronzed and purple grackles,—nor always *with* it, for that matter. Whether the distinction in these forms holds or not is mainly a question of interest to those who are making certain technical studies. For the vast majority of us it is quite sufficient to call it a crow blackbird.

In the case of the supposed occurrence of a very rare bird, or one new to the region, of course the specimen in possession would prove the record. When the bird is merely seen, much will depend upon circumstances whether or not it can count as a record. If it is very distinct in appearance, easy to recognize, and is seen by a person familiar with the species, it may be accepted, whereas of a puzzling species, or of supposed rare records made by the absolute novice, there would be room for doubt. This need not trouble bird-lovers of modest attainments. They are not burning with zeal to astonish the scientific world with new records. The study of birds for its own sake is abundantly worth while. We do not need to be anthropologists to enjoy our fellows, nor learned scientists to exult in our experiences with birds.

WHERE TO FIND BIRDS

CHAPTER IV

WHERE TO FIND BIRDS

THE plan of Nature seems to be that there should be birds everywhere. They are like a well-regulated police force, a sufficient number of them on duty wherever needed,—to guard every green thing from the attacks of the many sorts of insects, to prevent self-assertive plants, which we call weeds, from multiplying unduly, and, in general, to help preserve the balance of Nature. Hence, when things are normal, there should be no tree or plant that grows without its bird guardians of various sorts. Each species of bird knows its own province, and confines itself pretty closely to that, though some, like individuals of our race, will at times go astray.

Some of the birds, then, are at our very doors. Ignoring the imported English sparrow, which has spread all over most of North America and become a real pest, the best-known door-yard bird is doubtless the robin. Few there are who cannot identify that! Perhaps next to it in abundance comes the chipping sparrow, the little slender, brownish bird with unspotted light breast and a reddish patch on

the crown. You think you know it because you can distinguish it from the English sparrow? Make sure that you know it from the field sparrow, which is common in the pasture and low scrub and has a different cast of reddish on his head and back, and a pinkish bill, stouter than chippy's.

In winter another sparrow of this genus comes around the house to get weed-seeds in the garden, the northern tree sparrow, which looks very much like the field sparrow except that it has a distinguishing dark mark on the center of its breast. At this season its near relatives are far away south. The song sparrow, with heavily streaked breast, often appears, usually in the shrubbery of the garden or along the roadside. If there are dry open fields near-by, especially with rather poor sandy soil and sparse grass, the vesper sparrow ought to be found, easily recognized by the outer tail-feathers showing white as it flies.

In some localities, especially near the coast or well to the north, the savanna sparrow is the common member of its family on the open ground about home. It resembles the song sparrow, but its streaked breast is not so heavily marked; it is a trifle smaller and has a yellowish stripe over each eye. Still another species which is found in some places in the old fields is the grasshopper sparrow, which has a weak song like the strident fiddle of a grasshopper; it is shy and hard to recognize, with its dull tints. Look it up in the handbook. Thus we see that most of the spar-



Male Rose-Breasted Grosbeak, the only species which
"picks potato-bugs."



"The best-known door-yard bird is doubtless the Robin."

rows can be learned right around the house, and it will be a good feat to accomplish as an early move in the game of birds.

If there are evergreens in the yard, like as not a few pairs of the grackle or crow blackbird may take up residence in them to build their nests. The brilliant Baltimore oriole hangs its pouch-shaped nest from the tips of the elm-branches in many a yard or along the street. Frequently we may hear snatches of caroled song, and it will take some peering upwards among the foliage of the shade-trees to see the singer, the vireo, a light-breasted bird, greenish-olive above. It may be any one of three kinds: the commonest is the red-eyed vireo, slightly the largest, with very white breast, large bill, and a pronounced white stripe over the eye; the warbling vireo, of rather duller hues and a breast not so white; or the yellow-throated vireo, with a conspicuous yellow throat.

The little brown house wren may be a neighbor, nesting in some hole or other, or old tin can nailed up. It is a real musician, almost constantly pouring out a medley of bubbling song. The little humming-bird visits the flowers, and very likely has its tiny, downy nest saddled on some branch over the garden. Probably bluebirds live in the orchard, and one is fortunate if the lovely creatures consent to occupy the bird-house. More would do so, were it not for the English sparrow which drives them out. The same is true of the tree swallows and purple martins,

which now all too seldom are able to find lodgment, owing, in part at least, to the "feathered rat."

These cannot, however, dislodge the chimney swift, which comes so very close home as to build its basket-nest of gummed sticks in many a chimney of the older and wider type. Sometimes, when the young are growing, such a racket is kept up within the chimney, even at night, that it takes some enthusiasm for birds not to wish that these were farther off. Another notably familiar bird is the little gray phoebe, which puts its nest in any available building.

The orchard, even though small, is a favorite resort for certain birds, and even a few fruit trees in the garden have great drawing powers. Besides most of the birds already mentioned, the bold king-bird, our largest flycatcher, of excitable manners, is notably an orchard bird, defending its nest, and incidentally those of other birds, from marauding jay, crow, or hawk. The other large flycatcher, the crested, though rather scarce, likes the orchard, where in a hollow limb it builds its nest which is famous for always including a snake-skin in its material. The smallest species too, the least flycatcher, or "chebec," likes the orchard and the garden, as sometimes does one other, the wood pewee, with its prolonged plaintive note, though the groves are most frequently its temple.

That large woodpecker, the flicker, likes to carve out his nest in a dead limb or decaying trunk. The cedar waxwing, or cedar-bird, is very partial to the

apple orchard, particularly in its nesting-time late in summer. Its companion in tardy breeding, the goldfinch, while it may nest about the premises, is more apt to come for thistle and sunflower seeds. If the place be a farm, the barn and eave swallows are apt to take up residence in the barn.

During spring and fall migration, quite a number of birds are likely to drop in while passing. In spring the warblers make a most beautiful accession. Some days in May the blossoming apple-trees are alive with them and they are seen nearly everywhere. The pretty white-throated sparrow is quite apt to come in both the migrations, and sometimes the shy thrushes, even the hermit and olive-backed, are liable to favor us, though well back in the garden.

It must be evident from the above that there are a good many birds to study close at home, and if people are willing to use their eyes a little, they can learn a great deal with very little trouble. It is interesting, while studying birds, to keep an incidental record of all species seen on one's own premises. In my former home garden in Boston, during a series of a dozen years, I noted about eighty-five kinds of birds, and another observer, in a recent book, records one hundred and ten seen on Boston Common in a decade. Many happy odd minutes can profitably be spent with the opera glass in one's own yard. Indeed, almost any bird is at times liable to occur in such surroundings.

It would, however, seem rather indolent to wait

for the birds to come to us. There are many other sorts of localities to explore. Out in the grassy field or meadow we may hear and see the bobolink and the meadowlark. A very excellent and prolific sort of place is the scrub pasture. Here we shall meet the chewink and the brown thrasher. The field and song sparrows doubtless are abundant. The dark blue male indigo-bird mated to a dull brown little female is another kind to be looked for, and with about as much assurance the chestnut-sided warbler; also, in some localities, the prairie warbler. There the parasite, the cowbird, is about, the female ready for mischief, to deposit her egg in the nest of some smaller bird.

Especially if there are cedar trees, the purple finch may be found. This is another species where the different appearance of the sexes may puzzle the beginner. From the female the rich crimson "wash" of the male is omitted, leaving a streaked bird, a good deal like the song sparrow, whose thick bill and forked tail will betray it to those whose eyes are keen. That singular bird, the yellow-breasted chat, loves the scrub, briars, and thicket.

One must always bear in mind that birds are seldom wholly restricted to one sort of locality, and also that it is impossible to divide a region into hard and fast sections. Hence the best I can do, by way of general suggestion, is to mention several leading types of localities and a few of their most charac-

teristic birds. One need not be surprised to encounter many others, as will surely be the case.

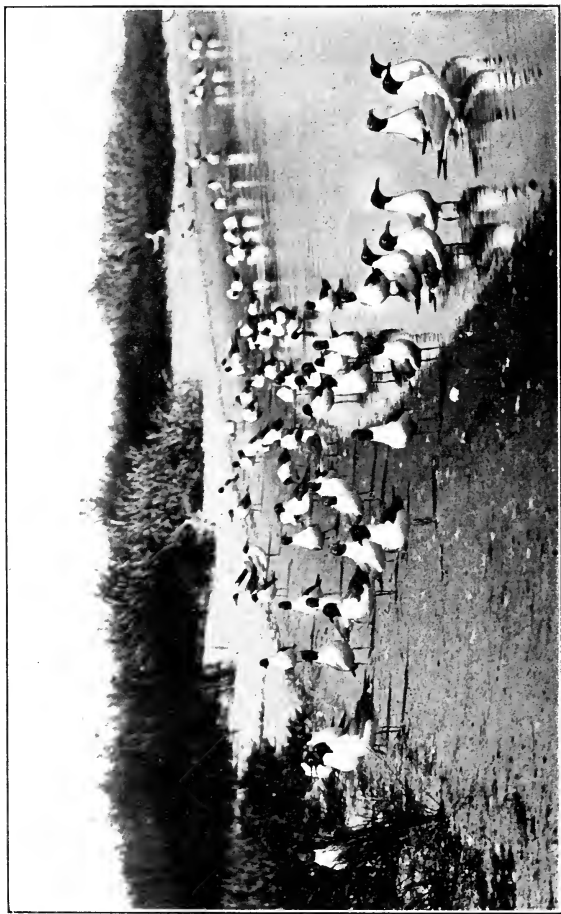
The type of locality that almost blends with the pasture is the bushy swamp, or swampy thicket. Here are various birds which easily overflow into the pasture. A notable case is the catbird. Anywhere where there are thick, rather high bushes one is liable to find it. This is true also of the yellow-throat, that inquisitive warbler of the swamps which the beginner will soon have to learn. It is supposed to sing "witchery, witchery," and its conspicuous feature is that suggested by its name, the male having also a pronounced black stripe about the eyes. In these haunts we may find, in migration, the mourning and Connecticut warblers. The white-eyed vireo is partial to thickets near a swamp or brook. It has a bold, ringing song, very distinct from that of the other vireos, and as it is quite apt to let one approach very near and see its funny eyes with the staring white iris, it is not hard to identify.

The rose-breasted grosbeak is especially partial to a swampy growth of young maples, where it nests, but the drier thickets often answer its purpose, and it even rambles to the garden. This bird resembles the purple finch in the difference between sexes. The female is also a sparrow-like bird with a very thick bill, but much larger than the purple finch or any sparrow, and radically different from her distinguished black and white husband with the rose-spot on his

breast. The cuckoos also seek the thick places, though frequently they locate in the orchard. The two kinds are not easy to distinguish, and the book-descriptions should be read carefully.

In places more swampy still, and rather more open, the red-winged blackbird is the most conspicuous citizen, especially the male, with his flashing red epaulettes, who will not fail to let one know where he is. Sometimes the kingbird will surprise us by dwelling in the bushy swamp, building the nest in the crotch of a bush over the water or even out from the shore of a pond. The swamp sparrow is partial to such places, where there are grassy tussocks among the bushes. It is in these tussocks that the rather rare short-billed marsh wren makes its nest. Where the swamp becomes the bog, with tall reeds or rushes, the long-billed marsh wren dwells and suspends its odd globular nest among the stems. Here are found certain water-birds, which will be described later.

The other main division of the landscape is the woodland, and a very charming one it is. Many of the smaller species thought of as woodland birds are more apt to be found near the edge of the woods, adjacent to open land or even human habitation. Among our most typically woodland birds are the thrushes, with the exception of the robin; yet even this familiar fellow I have found nesting in the woods. Most conspicuous of them is the wood thrush, of good size, with bright brown back and heavily spotted breast and sides. The only bird it



Laughing Gulls on Breton Island Reservation, La. Illustrates work from tent in colony.



could be at first mistaken for is the brown thrasher, but that is larger, more vivacious, and has a much longer tail.

The Wilson's thrush, or veery, is fairly common. It is rather a timid bird, not always easy to approach, but if we can get a look at its faintly spotted breast and unspotted sides, we can distinguish it at once. The hermit thrush occurs only as a migrant, save from the Northern States and on. Its "give-away" point is that the tail is of a brighter reddish brown than the back. The olive-backed thrush is another rather common migrant, and has a dark olive-brown back, very different from the others.

In the same rank with the wood thrush as the commonest woodland birds belong the red-eyed vireo and the oven-bird. Both of these are very voluble singers. The former has been called "preacher" because he talks so much, and the latter "teacher" because of a supposed propensity to repeat that word, louder and louder. The scarlet tanager is a wood-bird, though not averse to being near the edge by a house. Most of the hawks and owls are of the woods woodsy, and we shall give them a separate chapter. The ruffed grouse, that great game-bird, is perhaps even more than any of our birds, save the hawks and owls, a lover of the deep, lonely forest, where almost no other bird is to be seen or heard, unless there are evergreens with their black-throated green warblers.

This warbler and a number of others are notably

woodland birds. Most of these, however, go northward to the latitude of Maine and Canada. But the black and white warbler also stays with us, and so does the black-throated blue on high wooded hills among mountain-laurel undergrowth and the Canadian warbler in similar places. Most of the migrant warblers breed in the spruce and balsam forests of the far north. Others, like the worm-eating, hooded, and Kentucky warblers are content with woodlands of the middle districts. The two water thrushes, also birds of the woods, are much alike, but can be distinguished in that the Louisiana water thrush has a pure white throat, while that of the other has distinct markings.

The two tiny kinglets are denizens of evergreen forests, though they come around houses at times. Crows and jays nest in the woods, though the blue jay does so in pastures or orchards at times. Among flycatchers, the wood pewee, a dark, slender bird, prefers the deep woods, often, though, on the border of a road. The whippoorwill is notably a woodland bird, though at night it sallies forth into the open. Flush a fair-sized brown bird from the ground, silent of flight and long of wing, and probably it is the whippoorwill which at night makes the welkin ring with its odd cries. Its near relative the nighthawk is a bird of the open rocky field. It flies around overhead by day and is distinguished from the other especially by the white bar on each wing.

Most of the woodpeckers are also naturally wood-

land birds, notably the hairy, the yellow-bellied sapsucker, and the great pileated woodpecker which is as large as a crow. The rest of them are more or less partial to woods, as are some other birds which are not supposed to care for the forest, like the hummer, which I have several times found nesting in the deep woods. Some birds, such as the redstart,—that striking warbler, the male with his black and orange, and the female with her long yellow-marked tail, prone to spread,—love the edge of groves. Thither many a bird resorts, and in the early morning a great chorus arises where forest adjoins civilization.

Thus one might go on throwing out hints to help identify every last bird, but enough of the more numerous and conspicuous ones have been mentioned to give the beginner a pretty good idea of what are to be most readily encountered in the various sorts of localities. But let no one imagine that even these will show themselves upon the first demand. Birds do not bother themselves about our convenience or wishes. They will appear when they get ready, or, more likely, when we work hard enough to find them. If we have the true enthusiasm we will go where the birds are, into all the sorts of places where they are to be found, knowing woodland, swamp, and thicket, along with the nearer realm of field and garden.

LEARNING BIRDS' SONGS AND NOTES

CHAPTER V.

LEARNING BIRDS' SONGS AND NOTES

THE person who can recognize the notes and songs of birds has a great advantage in studying them over those who do not. To such a one the sound is the clear and certain announcement by the bird of its presence. Standing quietly, almost anywhere, he can say to a companion, here is this bird, there is that, yonder is so and so, and almost at once name a dozen or two species that are singing or calling in the immediate vicinity. If the other be incredulous about some particular species, he can listen again, take the bearings of the place from which the sound proceeds, and then show the bird to the doubter.

They say that "seeing is believing," but to a certain degree this is true of hearing, as well. Certain bird songs are just as characteristic as are the visual appearances of the birds. In a few cases birds can imitate the notes of others,—as the blue jay the scream of the red-shouldered hawk, but in the great majority of cases no such imitations have ever been recorded. Just as one can infallibly recognize Chopin's "Polonaise Militaire" or the Wedding March from Lohengrin as soon as the first notes are

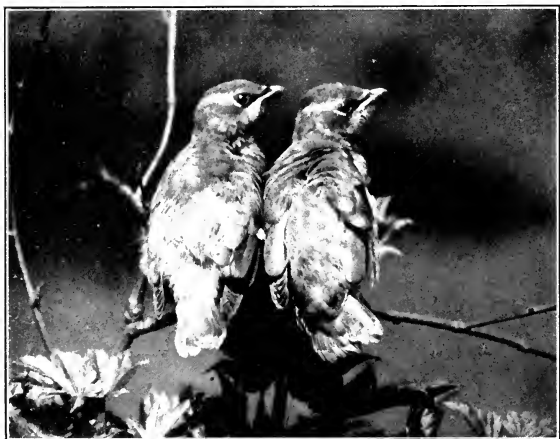
sounded, so does one the "conk-a-ree-e" of the red-winged blackbird or the rollicking medley of the bobolink. They are distinct and inimitable, and in hearing them one knows, not only that it is in correct form, but also that it is sung by the author.

If one is looking up some particular bird or birds, acquaintance with the bird's song or notes is of wonderful assistance. To cite an instance — I was out with a friend in early June to investigate blue-winged warblers, hoping to discover an individual of the hybrid forms of the Brewster's or Lawrence's warblers, and then to attempt to trace out the nest, so as to learn something of their little-known relationships. We went to some typical country for the blue-wing — the edge of woods bordering scrubby fields — and listened for songs. The usual song is a drawling lisp of two notes, very characteristic,—"ee-e, zee-e," — the "easy" song, I sometimes call it.

Almost upon arrival we heard one sing, and traced it out in the thick foliage. It was a typical blue-wing, so we left it and went on farther, heard another, and traced it out with the same results. This we repeated about eight or ten times, when the singer proved, to our joy, to be a male Lawrence's warbler. Knowing that the nest was doubtless not far from where the bird continued to sing, we put in two hour's hard work beating and examining the weeds and low bushes, part of the time on hands and knees, and then flushed the female from the nest on the ground under some sprouts and debris. It contained four eggs of



Brown Thrasher attacking the camera man in defense of its nest.



Study of young Cedar-Birds.



the warbler and two of the cowbird. It was a case of a typical female blue-wing mated with a Lawrence's hybrid — a fine and rare discovery, due entirely to our knowing the bird's notes. This suggests what can be done in many other cases.

There is nothing in bird-study more puzzling to the beginner than early on a fine morning about the middle of May, when the spring migration is in full tide, to be out amid the wonderful chorus of bird-voices and try to recognize the individual songs. It is more difficult than to segregate the different instruments of the orchestra in a symphony, for it is the symphony of Nature, a grander one than even the immortal Beethoven could devise. It is the model for the "symphonic poem," compared with which even so ingenious an one as Liszt's "St. Francis Preaching to the Birds" falls far short. More instruments and kinds of instruments play in this orchestra than in the wildest dreams of the very latest disciples of Wagner and Strauss. Its grandeur and elaboration are indeed confusing. While trying to hear one bird, a score break in, with not only the regulation notes but every variation upon them of which they are capable.

For this reason I consider that the best time to begin bird-study is the early spring, say in the cool weather of late March or early April, before the great host of birds begin to arrive. The morning is the best time for songs, especially early in the season, though there is some singing all day, and along in the

afternoon the chorus starts off again. As soon as possible get familiar with the songs of the more common birds, the "stand-bys." This will eliminate a considerable part of the later chorus from the ranks of the unknown and enable one to devote the time to getting hold of really new things, without wasting it in following up robins and the like.

I think that there is no better and more valuable advice that I could give at the outset than to impress upon the student who really wants to know the birds and to become expert the necessity of making free use of the note-book in writing down brief descriptions and impressions of bird's notes and songs. We find some bird of especial interest, and have a chance to hear it sing over and over again. "Surely," one thinks, "I shall always remember it." But memory is fleeting, and notably regarding so intangible a thing as bird-music. It is apt to be not long until the thing has utterly escaped us.

I remember, when visiting the Magdalen Islands, how much delighted the members of our party were in listening to the clear, beautiful, elaborate song of the fox sparrow. It became very familiar to us, so much so that I failed to write down any description of it, and now I cannot recall it with any clearness, when I attempt a mental or verbal rehearsing. I can make the same confession about the songs of certain migrant warblers, especially some that are scarce and do not sing a great deal with us. We hear them some day, and then may not happen to again for

years, and by the next time we have entirely forgotten. But just a few catch-words, if based on one's own experience, will recall them delightfully. Unless one has an unusual memory and ear for music, such a practice will be of the greatest value.

Most of us cannot attempt to set down bird-songs by musical notation. Many songsters do not seem to pay much heed to the intervals of our scale, or their notes are pitched too high for us to judge. Of course the notation would indicate time-values, yet few are trained to think in this way. To the majority, representation by some form of words to which the song has an imagined resemblance, at least in time and accent, will serve as a reminder to call up an image of the song as it sounded. Certain of these word-"mnemonics" that have been published have become classic and not unhelpful. The scarlet tanager is supposed to say "chip-churr," the white-throated sparrow "peábody, peábody," the blue jay "jay, jay," the chewink or towhee "tow-heé," the nuthatches "ank, ank," the quail "bob-white" or "more-wet," the night heron "quawk." Such words do very well to *suggest* the note, and many other notes or songs could be similarly suggested.

Where the songs are more lengthy, one can use repeated syllables, like "zee-zee," or "che-chee," with other vowel sounds introduced to show pitch or quality, as the vowel "o" for lower pitch, and "a" for harshness. For example we may describe the prairie warbler's song as "zee-zee," etc., about seven

of these syllables, at the same rate or tempo, in ascending scale, each note a little higher than the preceding. The song of the field sparrow is similar, only that these "zee-zee" notes begin slow and are delivered faster and faster toward the end. Or we might describe a familiar song of the black-throated green warbler, lazily droned from the tall pines, by both methods,—“a-a, see-e, ze-ze-ze, zee,” or “Ah, see, listen to me.”

Though comparisons are said to be odious, when it comes to helping to learn bird-songs, they are very useful and honorable. Dr. L. B. Bishop, describing to me the song of the worm-eating warbler, put it in a delightfully fresh and epigrammatic fashion calculated to stick in the memory. “If you hear a chippy sing in the woods, it is a worm-eater.” From such a description one could go right out, in a region which the bird frequented and find it, even if he had never heard nor seen it before. Here is another,—the song of the blackpoll warbler sounds like the rapid clinking of two pebbles together. How easily one can recognize the sound of those pebbles from elm or orchard the last of May!

Suppose, now, we are out for a walk in early April. Probably the first thing we hear is the loud caroling of the robin. That is a fundamental sound. Later we must note the difference between it and the Baltimore oriole's clear flute-notes, and the sweet, more continuous warble of the rose-breasted grosbeak. The song sparrow's pretty melody arises on all sides.

By this time the vesper sparrow is with us, in dry fields, and it will be well to take pains to distinguish his song, somewhat similar, yet perhaps sweeter and more subdued. The meadowlark's plaintive whistle and chucklings come from yonder field, and the red-winged blackbird splutters away in the meadow. From the orchard, or often from the skies above, comes the ethereal warbling of the bluebird, so characteristic, so welcome. In extreme contrast are the harsh cluckings of the grackle, or their wheezy creakings, as is the similar "wheel-barrow" chorus from the flock of migrant rusty grackles in the tree on the edge of the swamp, and the ludicrous "cluck-seé" of the cowbird, wrung forth by great convulsion of the body, is not much better.

The throaty little "phe-be" of the phœbe on the shed roof or the old bridge is very different from the clear "pee-wee-e" whistle sometimes produced by the chickadee in late winter, giving to many the false impression that phœbe is wintering in the cold North. This is the season when the simple, chippy-like trill of the junco is heard in the land, before it departs for Canada. The soft cooings of the mourning dove are wafted on the breeze from the edge of the woodland,—“coo-oo-o,”—sounding much like the great horned owl in the distance. We hear the faint lispings of the cedar-birds, which could best be represented by a line of the letter “s,” as the flock dashes by.

Notice the watchman's-rattle cry of the kingfisher by the pond or stream, and forever distinguish it.

The swamp sparrow and the pine warbler are among the rather early birds, and each has a simple trill after the manner of the junco. The sparrow, though, sings from the swamp, and the junco now is soon gone, thus making less the confusion of trills, though the chippy promptly takes his place. The crows are mating and noisy, as are the blue jays with their essentially corvine screams, their little rolling alarm-whistle, and mimicry of the hawk.

Early in May nearly everything pours in at once. It would be impossible and unnecessary here to describe each song, and there are special books to treat of this in full. My purpose is rather to throw out suggestions of method and practical hints for working, to start the bird-lover in the way he should go. It will be a delightful way, though not always plain sailing. In learning notes there is always bound to be some confusion and uncertainty. Even when one has learned the most characteristic songs and notes of many of the birds and thinks he can recognize them, he will find that most species have more or less variety in expression, and individuals often develop personal peculiarities in their speech. Some song sparrow will warble a new song and make you think, till you actually see it sing, that a new bird has arrived. This adds to the difficulty, but on the other hand makes the study all the more fascinating. If one persists, as with the musician, there will be in time a considerable and growing repertoire.

Perhaps I am not too fanciful when I feel that



Bluebird entering nest to feed young.

—p. 105



Female Redstart feeding young, removed temporarily from nest.

—p. 104



there is in bird-music considerable sentiment of the same sort as there is in our own. Sometimes there may be a suggestion in form, as when Mr. Henry Oldys notes in a meadowlark's song a snatch of the "Toreador Song" from "Carmen." More often to me the resemblance is in calling up the same sort of feelings which are aroused by some favorite composition. The wood thrush calling from out the gloaming brings to my mind sometimes the opening appeal in Weber's "Invitation to the Dance" and again "the sweetly solemn thought" of Handel's "Largo" from Xerxes. When the tinkling songs of the water thrush or the winter wren issue forth from the banks of the mountain brook in the forest, I seem to hear the rippling arabesques of Bendel's "Silver Spring." The bobolink almost sings the "friskas" or "czardas" of some of Liszt's Hungarian Rhapsodies, and the field sparrow the pearly ascending progressions of the "Song of the Rhine Daughters" from *Götterdämmerung*. Our American tone-poet, MacDowell, does not tell very much directly about the birds in his "Woodland Sketches," yet in the happy effusion of the fire-lit redstart I can detect the flavor of "To a Wild Rose," and in the mournful tone of the last lingering veery there is a feeling of "In Autumn."

As we learn to listen with appreciation to the songs of the birds, we shall be surprised at the wealth of suggestion and mental imagery which comes thronging to us. We need the bird-music, in this busy age,

to help save us from becoming prosaic and materialistic, to keep open the fountains of emotion and the vistas of sentiment, without which life would be sere in aspect, barren of its deepest and truest joys.

THE SPRING MIGRATION

CHAPTER VI

THE SPRING MIGRATION

THE period during which the majority of our birds return to us after the winter's absence is a time of peculiar advantage to the bird-lover. It seems good to welcome back our friends, and these pioneers give an especial thrill of pleasure. This feeling is the more enhanced because of the scarcity of birds during the winter. There is, too, a certain delight in being afield at the time when Nature is awakening, when the sun beams warm again, causing the spring aroma to arise from the fruitful earth and the early flowers modestly to open to our view. It might seem as though there were beauty enough to call people forth from their shells of sedentary employment even apart from the birds. Yet these will furnish an immediate motive without which many a ramble would be lost or postponed.

It is a fascinating no less than a healthful pursuit to "keep tab" on the arrival of the spring birds. As though realizing that it is important to make a good impression, they come arrayed in their very best garments, all of these new, and some a wedding outfit.

Everything considered, the birds are remarkably regular in their return each spring according to cal-

endar. Each species has a certain normal time of arrival, and in most years the dates will not vary much. It seems wonderful that, with only instinct to guide, they can sense the time as nearly as they do. There is, however, some variation, depending upon the weather. Unseasonable warmth will bring the birds on prematurely, and continued cold will keep them back, or at least the majority of them. Yet even then there are often individuals in whom the instinct is so strong that they brave cold and storm and come on time. The problem of the origin and cause of migration still remains shrouded in mystery, which adds all the more interest to observation of it. It will be largely through gathering of data by many observers everywhere that we can hope to come to a better understanding of it.

The watching of the migration will give special pleasure if several observers in a locality work together. It is really very exciting to try to be the first to record the arrival of the various species. One has a sense of achievement in being the first to see and report the new appearance, especially if it is some very early or unusual one.

In the case of those who expect to go afield at this time with considerable frequency and regularity, I suggest that they write to the Bureau of Biological Survey, Washington, and secure data-blanks for recording migration. There is a column on the left where the names of species are to be put down in the order in which they are seen. In other spaces oppo-

site can be given the dates when first seen, when at greatest abundance, and, in the case of those proceeding further, when last noted. This will not only furnish neat and convenient stationery for one's own records, but the copy returned to the Department at the end of the season will be a real contribution to science.

Quite a number of our hardier familiar land-birds winter in the Southern States and return to their familiar nesting-haunts comparatively early in the spring. Of some of these a few individuals are occasionally seen in Northern States in winter. Such species are the robin, bluebird, song sparrow, red-winged and crow blackbirds, meadowlark, kingfisher, cedar-bird, purple finch, woodcock, and various others. But the great majority pass on to Central or South America. On the return migration in spring, some come by the all-land route, through Mexico and Texas, but more of those that reach the eastern districts prefer to fly across the Gulf of Mexico. Of these, some take the easier route through Cuba or other islands of the West Indies to southern Florida. This route affords convenient resting-places to break the long journey.

The flight from Cuba to the Florida keys is only about one hundred miles, yet, when I cruised off the keys one April, I saw many flocks of small migrants flying low over the water headed for the land, some of which were almost exhausted. Yet it is surprising that the great majority of these migrants prefer to

fly directly across the Gulf of Mexico to Louisiana, Mississippi, Alabama, Georgia, or northern Florida, without a single opportunity to rest. Many of them are feeble fliers, and during unfavorable weather the loss of life must be appalling.

From the Gulf States the time required to migrate to the latitude of New England, according to abundant data secured by the Bureau of Biological Survey, seems to be ordinarily just about one month. Some species move more slowly and take about six weeks, while a few do it in half that time. These estimates are based upon the average progress of a species as a whole, and not on what a lively individual *might* do. The dates of arrival which I shall mention are for the latitude of New York City and southern New England. From these, according to the rate of progress as above, one can approximate the time for arrival in other localities.

The migratory movement begins before there is much sign of real spring. In some years by the last week in February, if there should be a mild spell and thaw, the first early spring birds suddenly appear. Our hardy quartette are the bluebird, robin, red-winged blackbird, and song sparrow. Each of these is occasionally seen throughout the winter. About the tenth of March, though, is more usually their time of arrival. Should the weather continue cold and stormy up to that time, and then a decided warm wave ensue, these birds will arrive almost en masse, and simultaneously with them some that are usually



Woodcock dabbling in margins.



Woodcock running, showing "flag."



due about the middle of the month. This was the case on the twelfth of March, 1907, when the deserted landscape of southern New England was suddenly alive with birds, which had arrived during the night. With the early four came crow blackbirds, meadowlarks, cedar-birds, phœbes, cowbirds, flickers, and an accession to the winter supply of crows, and probably others which I failed to note. Some of these are not ordinarily seen until the twentieth, or after.

The woodcock is due at this time, when one would think it impossible that there should be soft ground in which it could bore, or worms therein to keep it from starving. But if one will seek out open springs in warm sheltered spots on the edge of woods, with southern exposure, the reward may be the very pretty sight of the long-billed bird, in the rich hues of new plumage, flushing at close range and tamely alighting not far beyond.

Soon after the first woodcock we may expect to encounter small parties of fox sparrows along the roadsides or in the woods, and toward the end of March, the swamp, vesper, and field sparrows. Though the birds which have already arrived increase in numbers and the females, which are preceded by the males, have put in their appearance, additional species are slow to come, and meanwhile the winter birds are leaving for the north. Many water and raptorial birds arrive early, as will be told farther on.

During early April the tiny kinglets are in evi-

dence. The golden-crown, which has been occasional in the winter, has become more numerous where there are evergreens, and now the ruby-crown has joined it. The former has yellow on the crown,—the male orange and yellow,—while in the other the crown-patch is fiery red and the female lacks that ornament entirely. We begin to see the purple finch in numbers, though sometimes it arrives earlier. The American pipit, in small numbers, which can be recognized by its habit of wagging the tail, runs about open, rather barren fields or hill-tops, picking up food. The first of the warbler host, the myrtle and yellow palm warblers, arrive.

By the middle of the month we are glad to greet the hermit thrush, though he does not yet condescend to sing for us, and the first straggling swallows,—tree, bank, and barn,—which do not necessarily make a summer, for sometimes it snows after their arrival. Then, when they disappear, we fear that they have perished, for there is room for grave doubt as to whether individual birds caught too far north can run back for a time, as is the popular impression that they do. We may fear that a swallow without food in a snowstorm would not get very far, poor thing! Though they perish, others in due time arrive, and people gladly imagine that they are the same ones. The birds have no warm Pullmans and dining cars in which to journey.

During the last days of April the great wave of migration, in middle latitudes, begins to be felt. In

these days we see the first individuals of such typical summer species as the brown thrasher, towhee, whip-poorwill, chimney-swift, and a few more of the warblers, especially the black-throated green, black and white, and oven-bird. By the second week of May everything is pouring in at once, and a list of arrivals would include about all the small birds not yet mentioned. By the twenty-fifth of May most of the birds which go farther north have passed on, the rear of the procession being brought up by the blackpoll in the opening days of June, though occasionally the migration is greatly retarded when the season is cold and backward.

During the periods of migration there are some things of value which may be learned, if students will bear them in mind. For one thing we need to know more of the effect of weather and storms upon birds. Hence it is well to make note of conditions of weather — wind, approximate temperature, and precipitation — in connection with the other observations. In time a series of such notes, especially from many observers, would be of great interest and value. Make record of birds killed by storms. Have an eye out, too, as far as possible, for the directions in which birds are seen migrating, their special lines of flight, if any. From this we may gain new information as to their movements.

Birds do not always, by any means, migrate directly north and south, as they are popularly supposed to do. There seem to be certain "rivers" of migration, we

might call them, corresponding to the "lanes of navigation" used by trans-Atlantic steamships. River-valleys are notable highways of migration, as is the coast-line. Certain species are peculiarly limited in their distribution and migrate only along rather well-defined pathways, especially along the valleys of rivers or the sides of mountain ranges.

In some cases the course of migratory birds is locally deflected by conditions of topography. In illustration of this last it has been shown by Dr. L. B. Bishop, as a result of a long series of observations, that land-birds in migration following the Connecticut shore-line, when they come within sight of New Haven Harbor, are deflected and fly miles inland around this bay, rather than venture a mile or two across it.

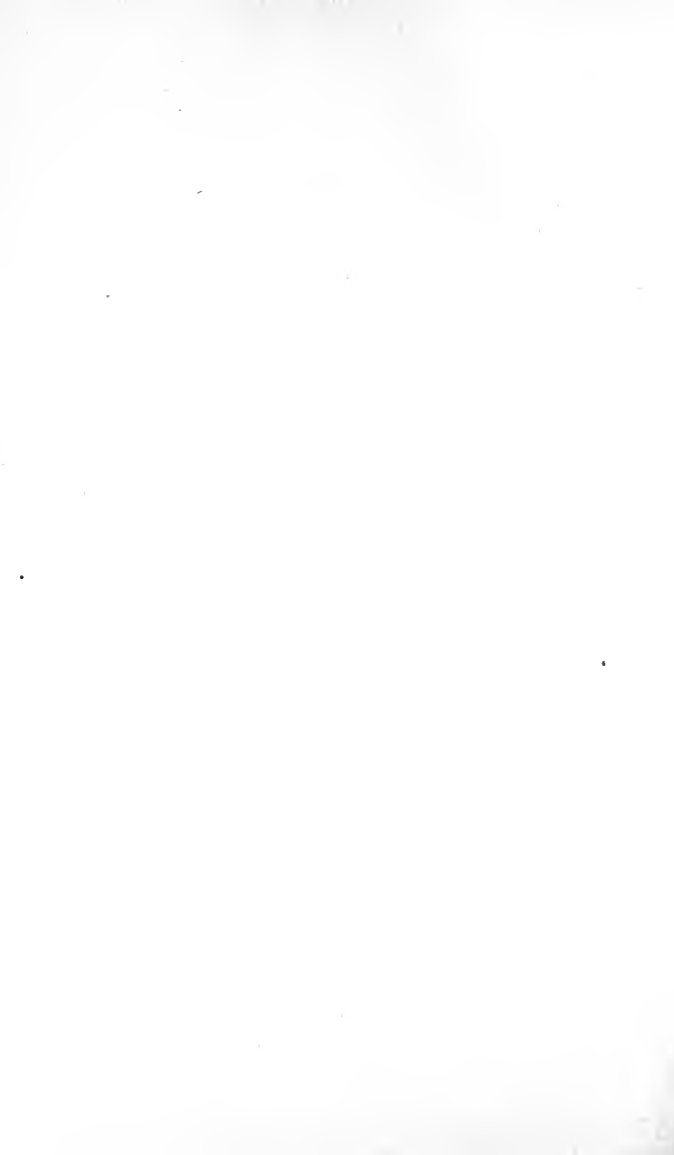
For many people the period of the spring migration is filled with exacting demands upon their time. We begrudge the hours of joy and sunshine in which we find ourselves cooped up indoors. I can still see myself writing examinations when the birds were warbling outside, literally gnashing my teeth in impotent vexation. Well, perhaps we appreciate the spring birds even thus more than though we could always be among them. Perhaps if we systematize the time, we can add to our opportunities. It may be a case of "early to bed and early to rise."

Much can be done even in a few odd moments from time to time. The birds in the spring migration are more in evidence than at any other period. They are on the move and in sight, they sing loudly

and constantly, they invade the garden with their welcome presence and come to our very doors. Even from the window, if there are trees near-by, some have seen rare and interesting birds — as when a friend of mine, one spring, from his windows was able, for the first time in his life, to study Tennessee warblers.

The main trouble with this delightful period is that it is too short. Before we realize, it has slipped away from us. Fortunately there are other good things in store. And if we have made good use of our opportunities with the swiftly-moving procession, we have gained a fund of experience and knowledge, of valuable notes, of delightful remembrance, which will remain to us as capital with which to enlarge our enjoyment.

THE NESTING SEASON



CHAPTER VII

THE NESTING SEASON

AS the spring migration passes into history, we are compensated by finding ourselves launched upon the full tide of what is in many ways the best time of all, the height of the nesting season, the time of love, of jubilant song, of beautiful home-life. It affords golden opportunities for intimate acquaintance with the life of many of the birds. During migration we see many of the birds individually, but of each one we gain at best but a fleeting glimpse ere it is gone, probably to be seen no more. But when we find a nesting-site we can return again and again to meet the same birds, observe their individual traits, learn how they spend their time, what they eat, how they build their homes, how long it takes to build, lay eggs, incubate, rear their young, how they feed them, and all sorts of details of their lives. Moreover, this is the time of all to secure photographs.

The height of the nesting-season, in the Middle and Northern States, is from about the twenty-fifth of May to the twentieth of June, four wonderful weeks of special opportunity. Short and fleeting it

is! Ten or twelve days of incubation, and eight or ten only for the young to grow from blind and naked worms to pretty birdlings fluttering from the nest. By the middle of June we begin to meet warblers which scold anxiously at us, and just as we think we shall surely find a nest, we see the other parent fly up on a branch and feed a youngster which is well able to fly. The beginning of the end! we sigh.

The intelligent finding of birds' nests is in itself an art, involving skilled knowledge both of topography and of the habits of the birds, as well as keen, trained eyes and an alert mind. Interesting and wonderful are the methods used by birds in concealing or protecting their nests. Some best secure their ends by confiding in man and building openly on his premises — like the robin, bluebird, chippy, phoebe, house wren, and the swallows. Others, like the woodcock, nighthawk, and whippoorwill lay their eggs boldly on open ground and trust to "protective coloration," the blending of their colors and markings with the surroundings. Of another type are nests built on the ground, hidden in grass, debris, or foliage.

Some nests in trees closely resemble their surroundings, as those of the hummer, wood pewee, and redstart. Other nests are concealed among thick foliage, as those of warblers which build high in evergreens, like the black-throated green and Blackburnian, or of thicket-nesting birds, such as the chat and catbird. Another class protect themselves by building high, like hawks and owls in tall trees, or ravens



Nest of Blue-Winged Warbler. A nest found only by days of search.



Nest of Northern Yellow-Throat, requiring vigilance to discover.
—p. 94

and guillemots on cliffs. Many water-birds select lonely, inaccessible islands.

Nests can be successfully hunted and found both by special and general search. In the first case one has in mind some particularly desired nest. The thing to do is to become familiar with the bird at sight, its songs or notes, and learn what sort of places it frequents and chooses for nesting. This can be ascertained in various ways — through books, from friends. Then go out and hunt for birds of that kind. When one is found, especially if it be seen repeatedly near one place, the nest will not be very far off. To be sure, it may be a hundred or two yards away, in any direction, or much more with large birds, which gives wide latitude for searching. But if one knows, even from reading, where to look, in many cases the area for search can be greatly narrowed, and it becomes largely a matter of persistence, activity, and keenness of observation to find the nest.

When it comes to the general search, to go out somewhere and look around for anything that may turn up, even the person who knows nothing of birds is liable to flush birds from their nests by merely "stirring around" or to spy out some of them. Yet one will accomplish far more through having at least read about the birds, knowing what kinds to look for in the locality chosen for the search, and how and where these birds nest. Such knowledge will keep one from wasting time in unlikely places or from looking in the wrong place for the nest of some bird which

is seen. One might see a ground-builder in trees and gaze upward all day, to no purpose. It is important also to have in mind the approximate period when each species can be expected to be nesting.

Though the majority of the birds nest in late May or June, it does not follow that the opportunities of nesting-time are confined to that halcyon period. If we travel, even in our own country, we can find some birds breeding throughout the greater part of the year. In south-east Florida the brown pelicans and bald eagles begin to nest as early as November, and in the North various birds are not through until late in August, or even in September.

In the Middle and Northern States the great horned owl fires the opening gun, so to speak, usually in late February, and the various large raptorial birds follow in March and April. The woodcock has eggs early in the latter month. Ordinarily the first of the smaller birds to lay is the bluebird, from the tenth of April and on, followed as a close second by the robin, and also the song sparrow, white-breasted nuthatch, hairy woodpecker, crow, crow blackbird, and European starling. This is ignoring the English sparrow, which seems to be multiplying its kind during a good part of the whole year.

It is a good plan to have an eye out for these early nestings, so as to save time later for other things. The bluebird and nuthatch use hollow limbs or holes in trees, generally near houses, unless the former consents to occupy a box. This also is the habit of the

starling, when it does not creep into some shed or the cornice of a building. The grackle's favorite locality is the evergreens in gardens. The hairy woodpecker prefers the woods, or swamps where there are dead stubs in which, or else in the solid wood of live trunks, it digs out the hole for its nest. The song sparrow's secret we discover as we tramp about and flush it from the well-hidden nest on the ground amid the tangle of grass, weeds, or bush, located almost anywhere in open land — wet or dry, it makes little difference which.

During May, not to speak now of birds of prey and water-birds, the blue jay, kingfisher, vesper sparrow, and ruffed grouse are at it good and early. The sparrow chooses open ground in a dry field, while the kingfisher hides in a deep tunnel in a bank, usually where some excavation has been made for gravel or in cutting a road. Almost anywhere in deep woods we are liable to flush the mother grouse from her large assortment of eggs, usually at the foot of some tree or bush or by log or underbrush. The jay nests in woods or pasture, even in the garden in some fruit or shade tree, but it likes a cedar or other evergreen pretty well.

The next installment, about the second ten days of May, are the swamp, field and chipping sparrows, meadowlark, phœbe, barn swallow, and Louisiana water thrush. Look for the swamp sparrows' nests in tussocks of grass in swamps, field sparrows' in pastures, under or in low bushes and weed-clumps.

Chippy builds in trees, vines, or bushes in garden, orchard, or pasture, and phœbe and the barn swallow like barns or old buildings, though both in wild districts, particularly the former, attach their nests to ledges of rocks; an old bridge delights the phœbe's heart. The meadowlark chooses an open field, and locates the nest at the foot of a tussock, usually with grass arched over it. It is difficult to find unless one can flush the bird, but ordinarily the male gives warning and the female slips away. Sometimes, though, I have surprised her and made her reveal her secret. The water thrush likes to build under the roots of an upturned tree or old stump in a wooded swamp, or else in a recess of the steep bank cut by a woodland torrent.

Then the flicker, downy woodpecker, chickadee, purple finch, wood thrush, brown thrasher, chewink, veery, oven-bird, blue-winged warbler, Baltimore oriole, and others get busy. During the last days of May the "advanced" individuals of almost any one of the species, with some few exceptions, are liable to have completed their nests and begun the task of incubation. By about the fifth of June nearly all the birds have eggs, and some are already hatching.

The early part of the general nesting period, when so many of the birds are building, is a splendid time to locate nests by watching the birds carrying material. A bird with any substance in its bill becomes to the bird-student a very suspicious personage, needing careful following. In a favorable locality near home,

or around the house, where one can do considerable watching, it is a good idea for one to scatter possible nesting material in the shape of bits of cotton, cloth, or yarn, and various birds may carry it off, thus making it possible to trace them to their nests.

A little judicious inquiry is often an excellent means of finding desirable nests. I do not hesitate to ask any farmer or boy whom I meet afield if he has seen any interesting birds or knows of any nests, explaining my purpose, that I do not wish to rob them, only to study the birds and take photographs. In this way many a desirable nest has come to me with little effort, which otherwise I should not have found—such nests as those of hawks and owls, woodcock, wood duck, dusky duck, quail, ruffed grouse, meadowlark, and many others. People living and working in the country run across such things, especially in cutting timber or brush and in mowing. A little courtesy will often be repaid many fold.

In open fields or meadows, where a number of kinds of birds are liable to be nesting, it is an excellent plan to beat over the ground systematically, on general principles, trying to flush birds from their nests. A good time to do this is in the evening or in wet weather when birds are almost sure to be sitting. More ground by far can be covered if one can secure help, perhaps from a boy, and drag a long rope between them over the grass. As the rope comes swishing over the head of the sitting bird, in most cases it will flush, and reveal the whereabouts of the

nest. By this method, on a grassy island in a lake out in Saskatchewan, a friend and I once found in one hour about thirty-five nests of various species of wild ducks which were hidden in the grass.

Bushy, weedy, and briary tracts are good places for the nests of quite a variety of birds. In such a place it pays well to course through it systematically, and with a long light switch strike at every bush, pile, or clump of any sort, wherever a nest might be concealed. By keeping patiently at this, one can be pretty sure, in time, to find various nests of any of the kinds of birds which are found in such a place. The same tactics should be pursued in a swamp. It all means activity and hard work, but it pays.

In such searchings one needs to be constantly on the alert, watchful for the slightest clue, the faintest note or sound, the merest suggestion of movement. Otherwise a great deal will be overlooked. Often upon the merest trifle hangs all the difference between success and failure. With the faintest rustle a rare rail or a short-billed marsh wren will slip from the nest and skulk off into the depths of secrecy. One day while tramping through a swamp, I thought I heard a slight sound, and looking quickly around, I barely caught sight of a quick movement, so quick, indeed, that I hardly knew whether I had really seen anything or not. It might have been a frog that jumped.

I stopped short in my tracks, laid my handkerchief on a sprout to mark the spot, and began to look



Nighthawk leaving nest near foot of weed.



Nighthawk nesting on low rock in open field.



around. There was no need to extend the search. Right between my feet, in a small tussock of coarse grass, with the leaf of a skunk cabbage arching over it, was a little nest with five white, sparsely spotted eggs. The owner had not left till I was fairly treading on her, and now kept carefully out of sight. Though I thought it was the nest of a yellow-throat, there was no telling but that it might belong to a mourning or Connecticut warbler, or some rarity. So I crouched down behind a bush and waited a quarter of an hour, when I saw the female yellow-throat slinking anxiously through the tangle, chirping her disapproval of my wayward course. What business had I to be in a lonely swamp tramping over her nest!

When the young are hatched, the parent bird will be more in evidence, searching for food and carrying it to the nest. This gives an excellent opportunity to trace it out by watching the old birds.

Do not imagine, when the twentieth of June is reached, that the nesting season is over. Some individual pairs of birds have been tardy, or have had some accident to their first nest and have built again. Various species often, and in some cases habitually, raise a second brood. The robin, bluebird, phoebe, catbird, quail, red-winged blackbird, all the swallows, and most of the sparrows, notably the song, swamp, chipping, field, vesper, and savanna, habitually raise two broods. Others which sometimes do, most of them to my personal knowledge, are the house and

long-billed marsh wrens, chickadee, yellow-throat, black and white creeper, red-eyed vireo, chewink, purple finch, meadowlark, hummingbird, and scarlet tanager. Probably there are others which do so occasionally, or at any rate have late broods.

The nesting-time gives great opportunity for learning very many things about the lives of even our common birds. Careful noting of all details of the habits of birds is very interesting and rewarding, and accurate record should be made of everything that is observed.

Avoid contracting the craze for collecting eggs. It is contrary to law, except to the few to whom permits are granted, and is unnecessary, in these days of illustrated books and well-stored museums. Except in the case of some few extreme rarities, science has little more to learn from such collecting. In fact it is often anti-scientific, and I know of cases where, for the sake of a hoard, some of the rarest opportunities for the real advancement of science have been destroyed. The present need is for detailed, accurate knowledge of living birds rather than dead ones, and along this line there is a splendid field for research. We may say of the scientific study of the birds of North America that the nineteenth century discovered and described them, and that it will be the work of the twentieth century to advance our knowledge of their habits and economic value.

It is a fact that there are few birds, if any, even the most common species, whose biographies have

yet been exhaustively or adequately written. This will afford worthy opportunity for generations of students yet to come. An excellent way to make important contributions to science is to select some one species and try to make a thorough, exhaustive investigation of its life-history. We may congratulate ourselves that we are not born too late to add to the sum-total of human knowledge.

NESTING EPISODES NEAR HOME

CHAPTER VIII

NESTING EPISODES NEAR HOME

MANY people seem to imagine that they are debarred from opportunity for interesting experiences afield with the birds because they live in town or city, and not in a wild natural paradise. Perhaps it may help to reassure them if I tell about some of my good times during the spring and early summer of 1909, within easy reach of my home in the suburbs of New Haven, Connecticut. It simply goes to show that no one need feel shut off from enjoyment of the wild birds by reason of locality.

On May 29, a beautiful bright day, right after breakfast I took a trolley car, and a short ride brought me near the edge of open country, from which point I soon was in a large tract of pasture-land and scrub growth, with swamp and woods nearby. There was a fine chorus of bird-songs, and I soon had noted a considerable number of species and had found nests of the catbird, robin, and song and field sparrows. The song which made the most impression on me was the "grand opera" performance of a white-eyed vireo in a thicket close by the roadside. I proceeded to investigate, and had hardly entered the

tangle when I came face to face with the female vireo carrying building material, and, looking about, I saw close at hand the nearly finished nest, a pretty cup, suspended from the fork of a little sapling, only two feet from the ground. The male soon appeared, and a great scolding and chattering ensued.

Withdrawing, I proceeded farther back into the scrub pasture, and presently, about two hundred yards beyond this, what should I see but another white-eyed vireo hopping about in a clump of chestnut-sprouts, carrying building material. I stood perfectly still, and in a short time it flew about ten yards to the beginnings of a nest attached to a low fork, two feet up, under another clump of chestnut-sprouts.

I was back there on the twelfth of June. Both birds had now finished their nests and were incubating full sets, the first of four, the second of three. They were very tame, and let me set up the camera and photograph them on the nest, though I was only four or five feet away. Both nests were handsome structures, but especially the second, which was a long, pointed, pendant affair, like a pouch. At each nest the occupant, probably the female, did a peculiar thing, which may be characteristic. In each case I happened to approach the nest, after the bird had left, just as she returned. Surprised on the edge of the nest, instead of flying off, she assumed a crouching attitude and remained right there perfectly still, as long as I cared to wait. In one case, after photographing the bird from where I stood, the idea came to me of getting



White-Eyed Vireo delivering a large caterpillar.

—p. 103



White-Eyed Vireo "frozen" at nest.

—pp. 102-3



a close view from above, showing bird, nest and eggs. So I moved the camera nearer, and the bird actually allowed me to take the picture, her white-ringed eyes staring in such a manner that no one could doubt what sort of a vireo she was.

Later visits were made after the young were hatched. The birds returned and fed the young in my presence, as I sat quietly a little way off, and I secured some pictures of the feeding process by using a mirror to reflect light, as I am unwilling to make a practice of removing occupied nests from their surroundings. On June 30 I made the final trip. The young had left the first nest some time before this. On the 26th those in the second nest were practically featherless and about half-grown, but now, in four days they had become fledged and had gone. As I was departing I had the good luck to spy one of them perched in a briar-clump ten feet from the deserted nest. There was no harm now in removing it, so I planted it a few feet out in the sunlight, and perched the youngster on its edge, after a few futile efforts of his to escape. The feeding process was soon in active operation, and I secured some beautiful pictures.

Another "find" near the vireos was an oven-bird's nest, on June 12. The bird darted out from a layer of dry leaves in an opening in the woods by a path, and I readily found the nest under the leaves, arched over in the usual manner. There were four eggs, one of them a cowbird's. That day I did not exper-

iment, but on the 17th, when the cowbird's egg and one other had hatched, I set the camera near, under a low bower of leaves. When I returned the parent was just leaving the nest, standing at the entrance, and I got a nice picture before she darted off at the sound of the shutter. She was not on when I returned again, so I took the camera away.

On the edge of these same oak woods I often heard a redstart singing near a path. Several times I looked vainly for its nest. One day, as I approached, I heard it sing, and followed it up. The sound came from a young oak beside the path, and as I reached the tree there was the male redstart singing lustily just below his nest, on which the female was sitting. It was a pretty cup, saddled in the main fork of the slender oak, about a dozen feet up. It blended nicely with the bark, and yet from one direction it was in plain sight of the path along which I had frequently walked. How could I have been so blind! There were four small young in the nest, showing that incubation had begun during the last days of May.

The trees were too slender to allow setting up the camera by the nest, so on June 17th I brought my reflex camera and, standing in the path, took snapshots of the parents feeding the young, as they came and went without fear. On the 21st, when the young were quite well fledged, I took a couple of them from the nest, posed them before the camera, and took pictures as the mother fed them. Bold as the father

was before, this was too much for his nerves, but he sang from a distance to encourage his mate. After I put the young ones back in the nest, both the parents resumed feeding.

Just across the road from where I found the first vireo's nest was a farm-house, near which were several promising subjects. One of these was the nest of a flicker, or "yellow-hammer," a hole dug into a cedar tree close to the road. The old birds were frequently returning to feed their young, ignoring the numerous autos. Fortunately the hole was only five feet from the ground, so I set up my camera against the fence, focused on the nest, and by pulling a thread from a distance each time the bird returned, easily secured a good series of photographs.

A little boy who lived on the farm became interested in my proceedings and showed me two blue-birds' nests with young in the pasture near-by, one in a low hollow of the tree, the other in a hole in a stump. The birds did not mind the camera set on a tripod near the nest, and I took pictures of their various family operations of feeding the young and cleaning the nest. There was also a song sparrow's nest in a low thorny clump of barberry bushes browsed short by the cattle. I set up the camera near it, covering it with sumach sprouts. These birds also were good to me and learned to run fearlessly before the camera and enter the nest by the little thorny tunnel to feed their young. The boy had as a pet a beautiful male rose-breasted grosbeak that he had

found with a slightly injured wing. It would hop around among the branches wherever we chose to place it and gave me some nice pictures.

It would take too much space to tell in detail of all the nests that I discovered all over this suburban region. The European starling I found nesting in hollow trees, beginning in April. In my yard the purple grackles had homes in the spruces, and it was amusing to watch them. In the woods I found nests of the red-shouldered hawk in tall trees during April, and later came across nests of the wood thrush, veery, and red-eyed vireo. Beating about in bushy pastures or scrub land, I had the pleasure of discovering nests of the blue-winged warbler, chewink, chat, brown thrasher, and chestnut-sided warbler, but somehow the rather numerous prairie warbler eluded me. The bushy swamp land disclosed nests of the Maryland yellow-throat, rose-breasted grosbeak, and yellow warbler. In my rambles I came across two broods of woodcock able to fly, and various other matters of interest, all of which goes to prove that people can find interesting bird-life near home if they will but look for it.

One species which I had often had in mind to photograph at the nest was the long-billed marsh-wren. These lively, happy little birds, fairly bubbling over with song, are so ridiculously tame as we meet them among the reeds and cat-tails of the swamp that I believed that they would make one of the very easiest subjects for the camera, as well as one of the

most artistic, in connection with their curious globular nests suspended among the tall green stems.

Learning from a friend of a marsh where there were plenty of them, on June 14, after quite a trolley ride, I alighted at the edge of the marsh, and soon was wading in the rushes along the course of the brook. On all sides arose the wren-songs, and very quickly I was finding nests, for they are easy to see when one penetrates to where they are. These birds have the curious habit of building dummy nests, seemingly to deceive intruders as to the location of the real one. So now, about one out of every half-dozen of the nests examined had eggs, nearly all with incomplete sets, for the bird is a late nester and waits for the reeds to grow tall. The eggs are of a dark mahogany-brown color, but are out of sight, for the nest is entirely arched over, and the eggs are laid inside. Sometimes the birds sang or scolded within arm's reach of me, but I noticed that when I was by a real nest they kept entirely away. When the sets are completed, I thought, they will act differently, especially when they have young.

Detained by other work, it was July 5 before I went there again, to meet with disappointment. Some nests had been robbed, others the young had recently left. An all-day's search revealed two nests with five eggs, second sets, only one of these being accessible to photograph. The next, and third, trip was July 14. The eggs were not yet hatched; I set the camera, with rushes arched over it, and hid at a

distance, a thread connecting me with the shutter. In two hours and a half the birds did not venture near the nest, though now and then one would come close to me, either singing or scolding. During this wait I made one excursion off and found another nest with four eggs. The birds made a great fuss when I examined their dummy nests, but were silent when I was near their real home. On July 24 the young in both nests were hatched and half-grown. I set the camera by the first nest, and after a long wait, finding that the bird would not come near, I tried the other one, thinking that these birds might have different dispositions, but it was the same old story.

As near as I could make out, the birds were shy of me as well as of the camera, though I had hidden thirty or forty feet away — as far off as I could watch the nest through the rushes. On my previous visits I had left my focus-cloth wrapped around some of the cat-tail "heads," in a way to resemble a camera, and the birds were accustomed to it. My last hope was to try the umbrella tent. I pitched it, where I usually hid, on July 26. First I left the vicinity entirely, and sneaked back to the tent, I think without being seen by the birds.

Stripping off all superfluous clothing to keep from melting, I knelt in the mud, and waited, keeping my eyes fixed on the nest, through a peek-hole. For two hours there was not a sound, save that a few times one of the wrens chattered a little near the tent. Since the middle of July their songs had mostly



Long-Billed Marsh Wren at nest. Photographed after five days of effort.

—p. 109



Virginia Rail on nest. Taken in same marsh as the wren above.

—p. 158

ceased. In all that time no bird went near the nest. I was well-nigh discouraged, when suddenly I saw a movement, and a wren appeared back of the nest with a worm! Hope revived again, though I feared that her courage would fail and that she would not quite dare to make the venture. However the young were calling for food, and after five minutes of parleying she hopped on a stem close to the entrance of the nest, but flew just as I was pulling the thread, spoiling my shot!

This was discouraging. Now the bird would see me for sure, and, learning of my presence, keep away for the rest of the afternoon. The sun, too, was getting dangerously low. Yes, she saw me and scolded, but after a quarter of an hour's wait she took a grub to the young, and I snapped her in the act. She darted off when the shutter clicked, but soon came back, after I had changed the plate, and this time did not mind the shutter. After this she, or they, abandoned all reserve, either convinced that I was harmless, or yielding to the inevitable, and made up for lost time in feeding the little wrens. By six o'clock, when the shadow had crept to the nest, I had eight exposures, six of which were successful, a fine series, which I certainly think I earned. And now I have no more delusions as to the tameness of the long-billed marsh wren. I have photographed hawks, and am inclined to think that this wren is about as shy as they, in a way.

An incident which occurred on June 16 seems to me

one of the most interesting and unusual in my experience. The night before I had given a bird-lecture in Hartford, and was entertained by a friend in the city. In an adjoining yard, between a house and a new one going up, was a space thirty feet wide in which grew an oak tree. On a horizontal branch twenty feet from the ground a pair of scarlet tanagers had actually built their nest, despite the noise of the carpenters, the play of the children beneath them, and the passing on the street close by.

I had been told of the nest before I came and had brought a camera. The first thing in the morning I borrowed a long ladder from the carpenters, set it up against the nearest branch, about eight feet from the nest, and photographed the tamely sitting bird. Then what should she do but stand up on the edge of her nest and inspect developments in her nursery. Two of the four eggs had just hatched, and she proceeded to eat the shells, after which she resumed her brooding.

To try for a picture at closer range, expecting to flush the bird and leave the camera set attached to the ladder, I moved the latter against the branch with the nest, about a yard from it, and went up. To my great surprise I found the bird still brooding, right before me. Some twigs and leaves impeded the view, so very carefully and quietly I bent them back temporarily, my fingers almost touching the bird, yet she never stirred. She then let me screw up the camera and take all the portraits of her I wanted.

The idea came to me to try to depict her tameness, so I made ready for an exposure, and, holding the bulb in one hand, touched her with the index finger of the other. Instead of flying off in terror, she actually pecked the intruding member. I was all the time very gentle with her, and presently I found that I could do anything with her that I wished. Next I stroked her, then raised her up a little, and finally took her in my hand and lifted her off the nest. Not only did she make no effort to escape, but perched tamely on my fingers, and then hopped back to cover her young. Of all these events I secured pictures.

Twice the brilliant scarlet and black male returned with food for her. Had I not been there, he might have come to the nest to feed her, but as it was she flew up to him in the tree, where he fed and caressed her and then departed, after scolding me a bit. On another occasion she flew off, but came back in a moment with her mouth full of soft, regurgitated food, which she fed to the young, unabashed, though I stood there on the ladder within easy reach of her. I even touched her as she did this, without alarming her at all.

My last "stunt" was to dig some worms and grubs in the garden and feed them to her as she sat on the nest. She took them gratefully and with alacrity. The family in an adjoining house, from a window about fifteen feet away, watched and enjoyed the tanager family. When I took the train home that

afternoon, it was with feelings of real affection for that wonderful bird and her little family.

Subsequent news of them was to the effect that ten days later four little tanagers left the nest successfully, and that on the tenth of August the redoubtable tanager had another nest forty feet up this same oak and had begun to incubate three more eggs. This is a remarkably late date and the only instance which ever came to my knowledge of this species having two broods in a season.

When such occurrences may be at any time the reward of the bird-lover, what wonder that we take delight in roaming the glorious out-doors, enjoying what we see and stimulated by the expectancy of the ever-impending fortunate discovery!

THE AUTUMNAL FLIGHT.

CHAPTER IX

THE AUTUMNAL FLIGHT

ALMOST before one can realize it, the season of nesting has slipped away from us, and we are confronted with the conditions of autumn, when we may again greet the passing procession of migrants and must say goodbye to them and to our summer birds. It gives a sort of uncanny feeling to realize that the birds which, seemingly, only a few days ago were singing and nesting, have now reared their young and silently departed, soon to be hundreds or thousands of miles away.

While we are still watching the late broods in their nests, the autumnal flight has set in. The first symptom of this, to be observed mostly along the sea-coast, is the appearance of bands of shore-bird migrants even in July. But the more universal sign is the flocking of various land-birds. Even before they migrate they gather into flocks. As we traverse the country road in August, we note the straggling bands of various sparrows that keep flying up along the roadsides. They are mostly chipping, song, field and vesper sparrows, with savanna sparrows where these are common, and now and then some others. Their plumages are now so juvenile or worn that it is

hard to distinguish the nervous little dodgers. No doubt there is many a rarity among them which we let go unrecognized. If only each sparrow species were distinct in color, we should find many a good thing. Even as it is, we are always liable to see some bird of special interest in these motley companies. One day, as I drove along a country road, a flock of chippies flew up and alighted on the fence, and among them was a pure white one, a complete albino, a rare freak. Two weeks later I was driving about a mile from that place, when, lo and behold, there was my white chippy again!

Even more noticeable than the flocking of sparrows is that of the swallows and of the various blackbirds. The former will be seen in long rows on the wires, or flying over water, swamps, or marshes. The various species flock together. They begin to gather in July, but more noticeably in August, which is also true of the blackbirds. Crow blackbirds and red-wings swarm on the marshes in united armies. The former by themselves gather in compact flocks in towns and perform varied evolutions in the air, dashing over houses with a roar of wings like thunder. The boblinks had reared their young by early July, and began flocking forthwith. By the latter part of July the black and white males are in a mottled plumage, changing to the yellowish-striped garb of the female and young,—“reed-birds,” or “rice-birds,” they are now called, thoroughly changed in character. In some sections the European starling has entered the



Breeding Royal and Cabot's Terns, Louisiana Reservation, where reflecting camera was essential.

Bird protection at its best.



field as a symptom of autumn, and they too gather in large flocks, sometimes associated with the other blackbirds. The meadowlarks or "marsh quails," are also flocking in fields and marshes.

In August also begins quite a movement among the warblers. Few of them raise two broods, unless it be the yellow-throat; they are prompt in beginning and swift to finish. Before June is over, most of their young are strong on wing. Forthwith they begin to ramble, and even by early August individuals of several species have begun to work their passage south. The blue-winged and golden-winged are among the first to leave or to appear in new localities, likewise the Canadian and chestnut-sided warblers. During the last half of August we may see almost any of the warblers, though they seem few and hard to find. But with September their numbers greatly increase. Some days one can see hardly any, and again they are abundant, though in a different way from their appearance in spring.

We need not now expect them in the orchard and garden; the proper place is the woodland and swamp. Shrubbery near water is a favorite resort, but they also straggle through the woods, duller in plumage than in the spring, and the young of many of them are particularly hard to distinguish. Some of them are gone by the very first part of September, but most species are found till early October, and a number till late in that month. Early September is often hot and summer-like, and during the first half, under such

circumstances, birds will seem very scarce. But let it turn cool, and the migratory wave starts along.

The abundance of migrants at any date varies greatly from year to year. My notes record that one September birds were scarce up to the middle, and then a perfect flood of migration set in. On the seventeenth I wrote down that the numbers of blackpoll warblers in the woods were almost beyond belief, and many other birds were found in profusion. But a year later at the same date birds were very scarce, and through September it was hard to find a blackpoll. Not till the middle of October did I note any large tide of these birds.

To find birds in the autumn we must depend almost wholly on seeing rather than hearing. Sharp eyes rather than ears now count. The songless warblers hardly seem like the same birds that in spring were constantly breaking forth into joy. The little lisp or chirp which they emit seldom has any distinguishing quality. It simply makes us aware of the presence of a bird, and we must hunt each one to see what it is. We may well be thankful if they make any sound at all.

The flocking of certain other birds which I have not mentioned is noticeable in September. That of the nighthawks then reaches its climax. Some days during the earlier part of the month they keep passing in straggling bands, but the flight began in August, and by the middle of September nearly all have left us, though a few may be seen later. The chimney

swifts are another curious clan. They will suddenly arrive in a great loose flock in the same locality year after year. Flying about actively till after sundown, they suddenly begin to pour in a stream down a certain wide chimney, their chosen roost, to which they resort at each return. Sometimes they continue to pour in for half an hour, until there are thousands inside clinging like bats to the bricks, in which restful attitude they pass the night. It is a great sight, at its best resembling the revolving funnel-cloud of a tornado. But there are people—and we cannot blame them—who dislike the dirt and noise and put a wire screen over the chimney-top to keep them out.

Most of the swallows forsake us in September, the purple martins usually leaving first, but the white-bellied or tree swallows remain late. They are often still quite common about the middle of October, and I have seen them up to the very last of the month. Those who have watched a flock of these swallows drink in unison have seen a very pretty sight in bird-life. A large flock of them are flitting about irregularly over a large body of water. Suddenly, as though at a signal, every member of the flock darts for the surface of the water, and all dip their bills at the same instant, making a noise like the first dash of the rain in a violent squall. Then they all dart upwards and turn, their wings causing a roaring sound as of the wind in the tree-tops.

In early autumn various small fruits and berries

are ripe, such as black cherries, grapes, poke-berries, etc. Many birds gather to feed upon these, notably robins and cedar-birds, but many kinds of birds will try a hand at them,—flickers, bluebirds, various thrushes, finches, orioles, and others. The ruffed grouse is fond of such things, and I have seen them stay to eat longer than was prudent at the approach of the hunter. Sometimes the shrubbery by the roadsides is very much alive with these various lovers of fruit, and it is a pretty sight.

There is in the fields a distinctive flavor of these late summer and early autumn conditions which is especially attractive. It is the time of ripening fruits, of harvesting of grain, of hayfields swept and garnished. Bobolinks and blackbirds flock to the grain-fields to glean as well as to pillage, and so do the pretty mourning doves. I enjoy flushing straggling flocks of the latter and watching them go kiting off at their swift and even pace. The meadowlarks are there too, and their attractive browns and yellows blend charmingly with the yellowing of grass and grain. The host of the various finches and sparrows is in evidence. Along the edge of the fields or in the scattered trees is a good sort of a place to find various flycatchers.

The September woodland has its special charm. While the general aspect is like summer, the sight of occasional bright leaves and berries and a peculiar cooling and fragrance in the air impart a delicious feeling,—call it autumnal anticipation. The mi-

grant birds encountered strengthen this feeling. Among those that seem especially characteristic is the yellow-bellied woodpecker, or sapsucker. It is a beautiful bird, and somehow I seem more apt to meet it in autumn than in the spring. This last is notably true of the Connecticut warbler, that retiring traveler, characteristic of the cool, moist woodland, which is rare in spring, but in September at times becomes almost common. Somehow I love to hunt them out and feel that I am witnessing an annual event. What delight it gives to strike a warbler day in the woods when the flight is well on, and we are meeting, every now and then, the mixed parties from which we try to pick out the various species. Another characteristic migrant is the blue-headed vireo, noticeable from the distinct white ring around the eye. Then there is the demure and shadowy olive-backed thrush back amid the shrubbery, and the other thrushes as well. The ruffed grouse whirs off, almost invisible through the thick leaves. We are encountering far more hawks than could have been seen in summer. Now and then a solitary one, of almost any kind, may glide through the trees, or overhead they may be straggling past in scattering flocks, in any of which various species may be represented. Many of them are the young birds, and this is the time of year to see them in numbers.

Rapidly does the aspect of things change with October, the period when Nature is in gaudy array, of nuts, of frosty mornings, and glorious bracing air.

The frosts bring flights of water-fowl to swamps and waters, and of woodcock to the moist cover. In the meadow we may look for the Wilson's snipe that darts up, no easy target for the gunner, and the last of the rails, that flutter from the world of tangle, all too easy a mark. Juncos and white-throated sparrows flit before us almost anywhere. The lisp of the kinglets and brown creeper is again to be heard, with the quaint gutturals of the two nuthatches, of which the red-breasted is the typical one which we are glad to see. The last of the warbler migration is passing, the more tender kinds having gone long since.

Among our hardier delinquents are the black-throated green, black-throated blue, blackpoll, yellow palm, and myrtle warblers, the latter being the hardest of all, the only one which may dare to winter with us. The winter wren is back, to dodge among the brush-heaps and other debris — a mouse of a bird it is. This is the time for the rusty grackle to flock again along the meadows, and the pipit on the dry open fields, when flocking robins, bluebirds, various finches, red-wings, and last flocks of tree swallows are in evidence. One by one the last of the remaining summer birds are seen and the winter residents appear, most of the real northerners not till the month is over.

As there is a charm to October, so there is to November. The birds have now come mostly to a winter basis, but the country has opened its portals to us. With the fall of the leaves we can see long distances through the woods, and watch the grouse and wood-

cock whir off through the bare trees. The temperature is just right for vigorous exercise. The wonderful haze of "Indian Summer" is in the air. If there are steep hills, it is a delight to explore their wooded recesses, or to gain the summits and look off over the panorama of loveliness. The snow and ice have not yet come to make the walking laborious, and it is a splendid time to explore and find new bird-haunts for the coming season. Many of the nests once so successfully hidden are now open to our view, and we gain ideas as to where to look for certain nests when June returns. The climbs which in July or August would nearly have melted us can now be taken without either perspiration or chill, and with exhilaration.

KNOWING THE WINTER BIRDS



CHAPTER X

KNOWING THE WINTER BIRDS

UPON the approach of cold weather the woodchuck, dreading the sting of frost, shuts himself up in his stuffy burrow, to appear no more till the proverbial day when he is supposed to venture out to look for a sign of spring; even then, seeing his shadow, he may retire for another six weeks of poor ventilation. Curiously enough there are many people like the woodchuck in this regard, who think that winter is no time to be outdoors. Unless forced to an occasional exit, they are "shut-ins."

At best they but venture from house to house or for a short walk in a city street. The long "exposure" to overheated and ill-ventilated rooms and to the ravages of the sedentary life is a most dangerous ordeal, producing weakness and inviting the attack of disease. Winter is a glorious time for active exercise outdoors, in some respects even better than summer, and if an interest in the birds can provide an incentive to draw people to the wintry landscape and set them, now and then, to scouring the open, it will be sufficiently justified.

It must be admitted, however, that the scarcity of birds in winter in nearly all localities, save in the far

South, tends to discourage many from the quest. Yet there are quite a number of species which winter even in the northern or middle districts, hardy creatures which are able to withstand rigorous conditions of temperature, storm, and scarcity of food. A wonderfully good idea of what birds are to be found in different parts of the country on a winter's walk can be gathered by reading in the January-February number of *Bird-Lore* each year the reports of the "Christmas Bird-Census."

The number of species seen by various observers in a day is usually from about six to eighteen, sometimes more — usually more on the coast, in the South and on the Pacific Slope. At times, one will hardly see a living thing, but if one has acquired an interest in birds, their very scarcity will make the appearance of the few all the more welcome. The sight even of a single interesting individual under these conditions will give a feeling of pleasure more vivid than might be aroused by many a songster in May.

The birds to be seen on a genuine winter outing are not all the reward. There is a keen joy in ranging the leafless woods and looking through vistas that are closed in the leafy season. Climbing steep hills is a keen delight, when the cold conduces to activity, and one is able to maintain a glow of warmth without being overheated. One can examine glittering cascades of ice, see the forms of the trees, and view miles and miles of country. All that is needed is an incentive to get us out, and the birds supply it.



Chickadee at lunch-counter. Feed the winter birds.

—p. 129



White-Breasted Nuthatch, attracted by suet.

—p. 129

Before going far afield we shall do well to pay attention to the birds that come to our very doors, seeking food in the time of scarcity. The good custom of putting out food for the birds has now become very general. The insectivorous kinds enjoy a piece of suet, fastened in a tree. It is well to place it by a window where it can be watched readily.

In a mild winter, when food is easy to get, the birds may not use it very much, but let there come a heavy fall of snow followed by bitter cold, and they will be glad to accept our hospitality. In some severe winters I have had birds in numbers at my lunch counter almost constantly every day. Perhaps most numerous will be the little black-capped chickadee, with his breezy manner and cheering songs.

Usually a very regular customer is the little black-and-white-spotted downy woodpecker. The hairy woodpecker, which looks just like his downy cousin, but is quite a bit larger, sometimes comes, but it is a shyer bird and generally less plenty. Another familiar friend is the white-breasted nuthatch, an exceedingly vivacious fellow, blue-gray above, with black or blackish crown, and white beneath, a regular acrobat who climbs like a woodpecker and is as apt to run headlong down a tree as up it. The saucy blue jay may also pay his respects.

The seed-eating birds do not care for the suet, so for them there should be a supply of seed or small or crushed grain placed out near house or barn in some warm, sheltered spot, with a cover above it to keep

it from being buried under the snow. Unless the hordes of English sparrows can be kept away, they will monopolize the supply and drive off the desired visitors. The shotgun is the surest remedy, and it may be said in the sparrows' favor that they are usually quick to take such a hint.

With the coast thus clear, the pretty tree sparrow is likely to be the most frequent guest, with numbers of juncos at times, and an occasional song sparrow. Sometimes on farms quail will feed around the barn in severe weather, but this is too good to be more than exceptional.

Our winter land birds may be readily thought of in three classes. First we may mention the species which are found at all times of the year, known as "residents." In a few cases, as with the ruffed grouse and the quail, the same individuals are found in one locality the year round.

With most of them, however, those found during the warmer seasons probably migrate southward, to be replaced by other individuals of the same kind from farther north. To this class belong the chickadee, white-breasted nuthatch, song sparrow, blue jay, and downy and hairy woodpeckers, already mentioned. Some others are the crow, meadowlark, goldfinch, and occasionally the flicker, cedar bird, purple finch, red-winged blackbird, kingfisher, bluebird, and robin. Many of the birds of prey also belong to this category.

[The second class are birds nesting a little north of

us and ordinarily migrating past us to the South, a few of which may linger for the winter in the Northern and Middle States. Of these the principal examples are the myrtle warbler, junco, winter wren, brown creeper, white-throated sparrow, and the two kinglets, especially the golden crowned.

To the third class belong those species from the far North that ordinarily come to us only as winter visitors. These are the snowflake, horned lark, Lapland longspur, tree sparrow, northern shrike, pine siskin, redpoll, the red and white-winged crossbills, and the pine grosbeak. With these belong some northern birds of prey, such as the snowy owl.

It is well to bear in mind that various species of our summer birds are liable to constitute themselves members of the first class by some bold or careless individual remaining or returning in actual winter. I have seen the fox sparrow and hermit thrush in December, and even such southerly birds as the cardinal and mockingbird have been found in winter as far north as Massachusetts. It adds interest to winter rambles to have an eye out for these unusual occurrences.

A number of these species in winter are found in flocks. In open fields, where various seeds can best be found, we may look for flocks of goldfinches, siskins, redpolls, snowflakes, and horned larks. The last two are larger birds than the others and are more terrestrial, often being found in company, and yet easily distinguished, since the snowflakes are so

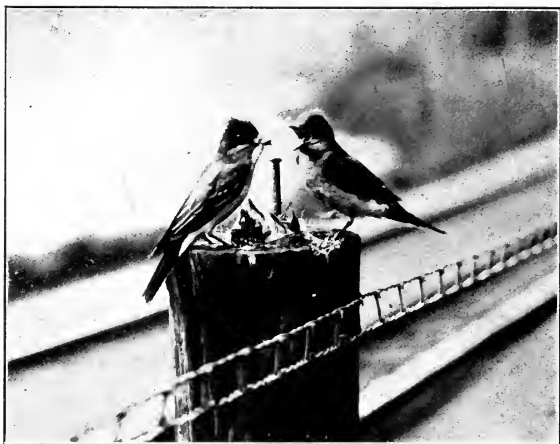
white. The first three more often cling to weeds to get at the seeds and alight on trees.

The goldfinch can be distinguished from the other two by its plain breast and black wings. The others have striped underparts, but the redpoll has a crimson patch on the crown and the adult males rosy-tinted breasts. The cedar birds and purple finches also flock, as do the crossbills and the pine grosbeak, and to some extent the tree sparrows, juncos, and meadow-larks, in straggling parties.

Some of the more northern birds are very irregular in their appearances, sometimes not coming as far south as Massachusetts for years at a time. This is notably true of the pine grosbeak, the two crossbills, and the redpoll. Their coming is thought to depend more upon the food supply than on the weather. The winters when they appear are hailed with delight by bird lovers.

When we see in the evergreens or shade trees of the garden a flock of gray birds about the size of a robin, we at once surmise that the pine grosbeak has come. They feed a great deal on buds, ash and maple seeds, and frozen fruit. The crossbills live largely on the seeds which they extract from the various evergreen cones — spruce, pine, and hemlock. Their mellow call notes uttered as they fly from tree to tree thrill us with delight.

Another thrill comes when one approaches a flock of small birds feeding on weed stems projecting above the snow, thinking that they are goldfinches, and sees



Entire Kingbird family at nest, on fencepost by railroad.



Flock of Pine Grosbeaks near house, feeding on ash seeds.

a crimson patch shining on each head — redpolls, from the very far north. But the flock, if not of the goldfinch, are more apt to prove to be the pine siskin, which is ordinarily more common than the redpoll, a heavily streaked little bird, with no color patch, and about the same size. Goldfinches, siskins, and redpolls all resort to trees as well as to open ground, especially along the edge of woods or in second growth, where buds, particularly those of birches, are a great attraction.

These wandering flocks of the various hardy northern birds will bear careful watching, not only on account of their own peculiar charm, but because with them are sometimes found even rarer strangers. Any flock of redpolls is liable to include a specimen of the hoary redpoll, a much paler bird, which seldom comes as far south as the United States. The flock of common cedar birds sometimes has in it one or more of the rare bohemian waxwing, which resembles the cedar bird, but is somewhat larger and has white wing bars and a black throat.

Snowflakes and horned larks often flock together, and with them one should always look for specimens of the Lapland longspur, a bird of about the same size and sparrowlike in appearance, with more or less black on throat and breast and buff color on the sides of head and neck. Another not common bird which may accompany them or be found in their haunts, especially among the sand dunes and beach grass along the coast, is the Ipswich sparrow. It can readily be

distinguished from all other sparrows by its very pale, bleached-out color.

When a supposed flock of pine grosbeaks is sighted, one may entertain the hope that they will prove to be the still rarer evening grosbeak. Once in a great while there will be a winter when this species comes in numbers across the Canadian border. It is a beautiful black-and-yellow or orange bird that one would not fail to recognize.

The parrotlike crossbills are about the only ones of our winter-flocking birds among which we do not hope to find greater rarities; they are of sufficient interest in themselves as they climb about among the cones, using bills and feet like parrots.

If a flock of "blackbirds" is seen in winter, it may prove to be one of European starlings. At present they are mostly found from southern Connecticut to New Jersey, but they are gradually and surely extending their range. It is characteristic to see a large bunch of them clustered in the elms over a street and to hear a chorus of high-pitched, rather faint whistles. They also descend to feed in the streets and gardens, but are shyer than their imported predecessors, the house or "English" sparrow. Those who meet a "blackbird with a yellow bill" have found the starling.

One boreal fellow who, though he does not flock, deserves more than bare mention is the northern shrike. If one should see a solitary gray bird with blackish wings, and tail, nearly as large as a robin,

perching on the topmost twig of some tree in open ground, this is the shrike or "butcher bird," waiting for the chance to pounce upon some sparrow or mouse. He is useful when he thus thins out the mice and English sparrows, but unfortunately he is just as liable to attack our chickadees, tree sparrows, and the rest.

If we live from the latitude of Maine northward we may add to our winter list the Canada jay, spruce partridge, and three woodpeckers — the arctic and the American three-toed, and the pileated. The latter is a big black fellow with a red-tipped crest, about the size of the crow, and is not only a Northerner but may be seen in wild wooded regions as far down as Florida.

Occasional hawks and owls make an interesting variation in the regular winter "bill of fare." A few individuals of various species stay in one place the year round, but most species either migrate or wander to some extent. Almost as steadfast as any are the great horned owl and the red-tailed hawk. Now and then we see one of these big hawks perched on some conspicuous tree in a field or along a road. It may, though, prove to be the red-shouldered hawk, a bird with a darker breast and nearly as large, or, by good luck, the American rough-legged hawk or the goshawk, both rather scarce winter visitors from the North.

Sometimes these are quite common in winters when there is an influx of such birds as crossbills and red-

polls, which they follow to feed upon. Occasionally one will meet the Cooper's sharp-shinned, and sparrow hawks. The greathorned owl is most often started in deep woods, as are the barred and long-eared owls, medium-sized species, and the tiny saw-whet or Acadian owl. The latter and also the little screech owl sometimes take refuge from the cold in buildings.

Out on the open field or marsh one may run across the short-eared or marsh owl, or even the splendid white arctic snowy owl. In Canada one may also find the great gray, the Richardson's, and the hawk owls, and from the Middle States south the odd, monkey-faced barn owl and the turkey and black vultures, or buzzards. The bald eagle may appear almost anywhere, and more rarely the golden eagle.

Inland the water birds are usually scarce because the waters are mostly frozen. Still, the "black" or dusky duck often manages to find a living in the swamps, and the goosander or large "shell drake" on rivers through openings in the ice. But on the coast there is quite a profusion of life. Various gulls winnow over the waters, the great majority of which are herring gulls, with a few of the great black-backed and ring-billed species, and rare boreal kinds as stragglers. Well off at sea the kittiwake may be found in numbers. Loons and grebes are swimming and diving. A number of species of marine ducks in flocks are careering about in striking formations,

or else are on the water in "rafts" feeding or resting.

Especially from Chesapeake Bay southward there are hordes of the various wild fowl, and some shore birds, such as plovers, sandpipers, and snipes, while northward from Massachusetts we may find on the cold wind-swept ocean such hardy birds as the razor-billed auk, the murre and Brünnich's murre, black guillemot, puffin, gannet, the eider and harlequin ducks, the cormorant and double-crested cormorant. Sometimes off Cape Cod during the Christmas holidays I have had a veritable feast for eye and soul in the abundance of these lonely wild birds, so shy and innocent of civilization.

Southward, say from Washington, the typical land birds, in addition to some already mentioned, are such species as the cardinal, mockingbird, red-headed and red-bellied woodpeckers, loggerhead shrike, Carolina wren, tufted titmouse, and brown-headed nuthatch. A considerable number of our hardier Northern summer birds are also found. The frosts are only occasional and moderate, and the air is delightful — with all due respect to the biting, exhilarating northwest zephyrs of the snow-bound regions beyond.

When we get as far south as Florida, it seems like mockery to talk of winter. To be sure many of the birds have crossed the sea to Central and South America, yet there are many left. The little ground doves are so quaint, the jays, including now the

Florida jay, so abundant and saucy, and the shore birds, herons, ibis, and many water fowl so interesting — save as thoughtless tourists have exterminated them along the well-traveled routes, a crying abomination!

It is delightful to escape a month or so of the intense cold and wander through the orange groves, the pineries, the swamps, or by the tepid ocean, among the birds. Yet last March, after a month in the temperature of the eighties, when I returned home and filled my lungs with deep drafts of the delicious keen air which had been kept on ice for me, it did seem that never in my life had I so appreciated a blustering New England March.

HOW TO FIND THE BIRDS OF PREY

CHAPTER XI

HOW TO FIND THE BIRDS OF PREY

IT would be quite safe to assert that hardly more than one bird-lover in a hundred — or maybe in a thousand — knows much from personal experience about the “raptors,” or birds of prey,—the hawks, eagles, owls, and vultures. Most of them are shy and retiring, resorting to the wildest and most inaccessible places in the general region where they live. The owls are nocturnal and generally hide away by day, so that, as a class, they are very hard to find. Owing to the difficulties in the way of knowing them, they have a sort of social exclusiveness, receiving only the insistent to terms of intimacy. The test of fitness for their society, however, is not one of descent or property, but of activity and enthusiasm. Knowledge of the hawks and owls is a pretty good indorsement of advanced standing in practical ornithology. The pursuit of them is so fascinating and success in it so exciting and gratifying that I especially commend them to the vigorous and active youth, and so am devoting a separate chapter to tell more in detail how to find and know them.

It is a common sight to see hawks soaring high up in the air or flying rapidly across the open country

toward the woods, but usually so far away that it seems hopeless to the beginners to distinguish them. Yet most of them can be recognized in an instant, even at quite long range, especially with the aid of the field-glass. In Eastern districts there are two large kinds commonly called "hen-hawks,"—the red-tailed and red-shouldered hawks. The former is a little more heavily built and has whitish underparts with a few darker markings on the breast; in the adult phase the upper side of the tail is of a uniform chestnut-red color, which can be detected as the bird wheels in the air and the sunlight strikes it. The red-shoulder, besides having a slight rufous color on the "shoulder" of the wing, has the under-parts of a much darker hue than the red-tail, brownish and heavily marked, and the tail banded with alternate black and white. The immature red-tail has a banded tail, but with fewer bands, and its light underparts are characteristic. Both these species soar and circle a good deal in flight, and are also seen perching motionless on isolated trees, especially the red-tail.

Another hawk with almost equal spread of wings but of more slender build is the marsh hawk, distinguished by the conspicuous white spot on the rump. This variety generally flies rather low, quartering over swampy land. In winter another large hawk with white on the rump is occasionally seen about open land, the American rough-legged hawk, a sluggish bird, as large as the red-tail, feathered to the toes. The osprey, or fish hawk, has white under-



Great Horned Owl incubating. Taken from next tree—a difficult stunt.



Young Broad-Winged Hawks. Photographed from next tree by G. Curtiss Job.

parts and long narrow wings which generally are held with a sharp bend.

Of the medium-sized or smaller hawks there are two that are especially common, and quite similar,—the Cooper's and the sharp-shinned hawks. They are closely related, and are characterized by the long tail, short wings, and a flight by quick flappings, with very short intervals of sailing. They can readily be distinguished by size; the sharp-shin is notably smaller, not much bigger than a robin.

Taking these common hawks as a basis, learn to distinguish them from certain others. One species about the size of Cooper's is the broad-winged hawk. In coloration these two are a good deal alike, but the broad-wing is a sort of miniature red-shoulder in form and movement. It has a short banded tail, slower wing-beats, and soars and circles like its larger relative. The duck hawk is about this size, a very dark bird with sharp wings and quick, incisive flight, but is so rare that most students will never see it. The goshawk is built like the Cooper's, but is noticeably larger, the adult having beautifully pencilled gray under-parts.

Then there are smaller hawks to distinguish from the sharp-shin. The pigeon hawk or falcon is a spring and fall migrant to and from Canada, a dark-colored bird, a sort of miniature duck hawk in general appearance. The other little fellow is the sparrow hawk, distinguished by its reddish back, a frequenter of open farm-lands.

Westward one finds the Swainson's hawk, a big bird, like the red-tail except that the tail has no red and is banded, and also the large ferruginous rough-leg, distinguished by its white tail. In the South there are several interesting species called kites. These are the principal hawks that the beginner is liable to meet.

Eagles are also hawks, strictly speaking. The golden eagle is so rare that the bald eagle, the bird of our national emblem, is the only species which one can expect to meet. The immature eagles are a dark brown, almost blackish, all over, the white head and tail not being acquired at first. The eagle is so much larger than any hawk that no one could fail to recognize it, unless in the distance they should confound the immature eagle and the buzzards or vultures, which, of course, have the bare skinny head and neck. Their soaring, though, is quite after the manner of the eagle. In the Middle States, and now and then in southern New England, the turkey buzzard is found, and farther south the other species, the black buzzard, a more heavily-built bird with a rather indistinct whitish patch on the wing.

The principal large owl is the great horned owl, with large ear-tufts and yellow iris. Another species, a trifle smaller, is the barred owl, which lacks ear-tufts and has black eyes. Even when not seen they can be distinguished by their hootings; the former usually has three notes in its "song," while the barred owl launches out in a more elaborate effort. In win-

ter the white snowy owl from the Arctic sometimes makes us a visit, more often along the coast, and fortunate is the student who meets with it. In all my travels I have run across but one.

Of medium-sized owls there are two which we may encounter almost anywhere in Northern and Middle districts,—the long-eared and short-eared owls. The former has ear-tufts and is a bird of dense woods and swamps; the latter is a frequenter of open meadow, marsh, or sea-shore, and practically lacks ear-tufts. The barn owl, with the “monkey-face” and white breast, is found in Middle and Southern latitudes, hiding by day in old buildings or hollow trees.

The common little owl is the screech owl, with ear-tufts, found frequently about houses and orchards. There is also the saw-whet owl, very tiny, with no ear-tufts, a bird of the deep woods and rather rare. Well to the north are found the great gray, the Richardson’s and the hawk owls, and on the prairies of the West and of interior Florida the quaint burrowing owl.

By far the best way to really know these birds is to find their nests and thus be able to study their home-life. They are nearly all early breeders. The great horned owl is first, beginning in Middle and Northern districts by the first of March. The barred owl usually follows suit about the first of April, often by March twentieth. Very early April is the time for the red-tailed hawk, soon followed by the red-

shouldered hawk and the long-eared, screech, and saw-whet owls. About May tenth is the time for Cooper's, marsh, broad-winged, fish, and sparrow hawks, and a week or two later the sharp-shin brings up the rear.

Most of the hawks nest in tall trees in the woods, building a rather rude platform of sticks in a main crotch, or taking and repairing some old nest of crow, squirrel, or another hawk. The exceptions are the sparrow hawk, which lays in a hollow tree on or bordering open land, and the marsh hawk which builds a rude nest on the ground in a swamp. Most of the owls use hollow trees or other cavities, but the great horned and barred owls are just as apt to appreciate an old open nest of hawk, squirrel, or crow, though they often use hollows. The long-eared owl habitually uses an open nest in the woods, and the short-eared nests on the ground in a swampy place, among grass and weeds, or under a bush.

The special hunt for the nests of hawks and owls is a fascinating piece of work. In preparation for it, a good plan is to previously explore the woodland tracts throughout the section of country to be investigated, during the preceding autumn and winter. The nests are large and conspicuous, and are frequently used again and again, either by the same bird each year, or by different pairs of raptorial birds, or else a pair occupies each of several nests in rotation year by year. If an old nest is not reoccupied, another may be built near it. Most of the species are

inclined each season to return to the same tract of woods. Sometimes they alternate between different adjoining tracts of timber, but where they have nested once they are apt to do so again, certainly within several years. Moreover the woods which suit one pair are apt to be congenial to others for the same reason, so each selected tract is liable to continue productive, if the birds are not killed off.

It is well to inquire of residents as to where hawks or owls have been seen or heard, as well as to direct one's own eyes and ears toward the same end. Where they are repeatedly heard or seen, there they will probably nest, or are so doing. Sometimes from open fields, with my glass, I have watched the wooded ranges of the adjacent hills and seen hawks fly right to their nests. All nests, even of the late-breeding sharp-shin, are built before the leaves are out, which is, of course, the time to find them. There is all the difference in the world between leafless woodland with its open vistas, and the same when it is dense and dark with foliage, so get at the work early.

The main prerequisite of success, then, is to know the country thoroughly, where every bit of large timber is, even small patches of it, and on the final hunt to go through it systematically. One can do better, ordinarily, in a region where there are few or no large continuous areas of forest, but where the old, tall timber is in scattered groves. This restricts the area over which the nests might be scattered.

Time can be saved by driving or riding from one such tract to another, thus covering many miles in a day.

In good woods there will be seen many old nests, any one of which is liable to be occupied. Most of them are up tall trees, and it will not pay to try to climb to each one. When a nest is seen, watch it carefully on approaching, to see if a bird should fly from it, as they sometimes do at first sight of the intruder. Individuals, even of the same species, vary much in this regard. Some will leave when one is a gunshot off; others can hardly be driven off by pounding the base of the tree. Some return to scold, while others never show themselves again. So hunt quietly. If no bird flies off, pound the tree with a club, and watch not only this nest, but any others near.

Some birds go at the first blow, others, especially in cold or wet weather, refuse to budge. The long-eared owl is apt to do this, which makes this nest a hard one to find. One great horned owl whose nest I found would not leave, early in the season, for any amount of pounding. When the young grow large, most raptorial birds tend to become much shyer, though some are bold enough to swoop at an intruder, though they rarely strike. But another horned owl, even in early March, would leave the nest before I came within gunshot. There is no uniform rule, and it is always interesting to see just how the birds will act.

In case the bird should happen to be temporarily absent from an occupied nest, as is often the case, especially before incubation has begun, one should know how to examine the nest itself for signs. One of the best signs is when downy feathers cling to the nest. If these are light-colored because freshly broken, one can see that something is doing. The sticks of a new nest stand up crisp and strong, whereas in an old one they are apt to be rotted down and sodden together. Birds of prey do not use dead leaves in building, as do squirrels, yet some will build a platform of sticks on top of an old squirrel's nest, so one must look sharp in every case for possible signs.

It is very desirable to use the field-glass to see these details clearly, which are not easy to detect unaided in a lofty tree, especially a thick evergreen. The sharp-shin prefers an evergreen, but the other species will use a deciduous tree just about as readily, though preference differs in different localities.

The finding of the nests of hawks and owls gives the very best sort of an opportunity to study them, and particularly to secure photographs. One can also learn a great deal about the habits of these wary, secretive birds, few of which are known adequately and intimately. To illustrate, let me tell a story. I pitched my umbrella-tent a little way from a tree in a hemlock wood, on which, thirty-five feet from the ground, was the nest of a sharp-shinned hawk. Only one of the eggs had hatched, and the youngster, nearly ready to fly, was hungry enough for a whole

family. I had a camera rigged up near the nest, and was in hiding for hours, on several occasions.

Now and then one of the old birds would bring a small bird to the youngster, all plucked, which he would tear up and gulp down in short order. At one time a family party of red-eyed vireos were feeding in the foliage close around the tent, calling to each other rather noisily. Suddenly I heard a violent rush of air, and the sharp-shin, almost striking the tent, seized a vireo, and perched with it close by. I could hear the dying wails of the poor victim, as the hawk began to pluck it. This process took some five minutes, during which time the young hawk was nearly frantic, jumping about the nest, stretching its neck, whining and begging. Then the old one flew up on the nest, delivered the morsel, and stood upright and still, watching her young hopeful struggling to rend the quarry. At this juncture I pulled the thread connecting with the camera and secured a picture.

Acquaintance with the raptorial birds in nesting-time will give a basis for recognizing them when they are met at other times of the year. In autumn, a great many of them are passing south, even at times in flocks, straggling along in open country, following water-courses or ranges of hills. When we are quietly prowling about in the woods, a hawk may suddenly dash in near by and give a chance to examine it before we are detected and the bird has flown. We may watch them as they circle in the air, or descend upon their prey.



Young Red-Tailed Hawk, with full crop after big meal.



Sharp-Shinned Hawk. Just delivered food to young one.
—pp. 149-150



The poultry-yard affords some episodes in hawk or owl story, but it is unfair to attribute depredations to all kinds of hawks. The Cooper's and sharp-shinned hawks and the great horned owl are the worst transgressors, also the rare goshawk when it is with us. The so-called hen-hawks only occasionally attack poultry, generally in winter when other food is scarce.

Most of the hawks migrate south for the winter, though a few individuals of all kinds sometimes remain to brave the cold. The red-tail is usually the commonest resident hawk in winter. The owls are somewhat more stationary, though they migrate to some extent, as is shown by the appearance of the snowy and other boreal owls.

This class of birds may be hard to find and know, yet there is for this very reason a romantic interest attaching to them. To know them well is a mark of a keen, active, successful practical ornithologist. Who then will go out in the forest and the cold and master the hawks and owls?

FOLLOWING THE WATER-BIRDS



CHAPTER XII

FOLLOWING THE WATER-BIRDS

MOST bird-lovers feel a distinct sense of achievement, a peculiar satisfaction, in experiences with the water-birds. They represent a much larger and more varied group than the raptorial, and like them are mostly inaccessible and hard to find. Owing to their size or edible qualities most of them have greatly diminished in numbers through shooting. Quite a number are found only out at sea, either in winter, or passing in migration far off the coast. The majority of them breed in northern latitudes. The nature of their haunts makes it difficult for most people to study them. However, all these things attach to them an interest of sentiment and mystery, which, when felt, makes one all the more determined to know them. For myself, the fever attacked me in its most malignant (or beneficent) form. Since I could not find all these types of water-fowl at home, I had to go where they were, until now, after chasing them from Newfoundland to Florida and Louisiana, and from Virginia to Saskatchewan, I feel that I can rightly number most of them among my intimate friends.

To mention first the seasons in which to look for

them, there are comparatively few which spend the summer and breed in middle latitudes. The only group which is well represented is the herons, and all of those which occur at all are summer residents. We have regularly the green, black-crowned night, and great blue herons, also the American and least bitterns. Look for the bitterns in reedy bogs, the herons in wooded swamps or along shores. The herons nest in trees or bushes, the bitterns on the ground. In the South are many other species. Next in numbers come the marsh-dwellers, a small group, of which we have in summer the sora and Virginia rails, while from the Middle States south the clapper and king rails and the Florida gallinule are found. Of the shore-birds only the spotted sandpiper, our familiar "teeter," is at all common as a summer resident. The piping plover, killdeer, and upland plover were once familiar residents, but now they have almost disappeared.

Of the swimming birds, only the dusky or "black" duck and the wood duck are at all widely distributed in the Eastern States, but by the prairie lakes and in the sloughs of the western interior, a number of others breed, as well as terns, grebes, gulls, coot, rails, and some shore-birds, and, well to the north, cormorants and white pelicans. In the inland waters of Maine and eastern Canada one may find breeding the loon, the horned and pied-billed grebes, the goosander and hooded merganser, and a few other ducks, and on the coasts of these districts the herring gull, black

guillemot, eider duck, red-breasted merganser, common and arctic terns, Leach's petrel or "Mother Carey's chicken," and double-crested cormorant. On islands from Massachusetts south the common, roseate, and least terns and the laughing gull breed locally and sparingly, the pitiful remnant of the millinery traffic. The black tern comes as a migrant, breeding in the sloughs of the Northwest. A few other terns may be met as rare stragglers. The species found in winter have been mentioned in the chapter on winter birds.

The periods of migration are the best times of all. In spring, April is the month for ducks and geese, and May for the shore-birds. On the southward flight the shore-birds begin to return in July, but the height of migration is in August for most of the smaller species and September for the others. One small species, the red-backed sandpiper, or dunlin, is very late, seldom appearing before the middle of September and being common in October on the beaches, after all the other small fry have moved on. October is the great month for ducks, and late October and November for geese and the hardier ducks, like the oldsquaw, mergansers, and eiders.

Inland, the migration of water-birds is, of course, not nearly as conspicuous as on the coast. Very little is seen of late years on Eastern inland waters of the shore-birds. Most frequently seen of this class of migrants is the solitary sandpiper, found alone or at most in pairs, by any little pool or larger body of

water. Now and then a flock of least sandpipers, or possibly others, may appear on lake or river margin. In meadows there may be seen an occasional single greater or lesser yellowlegs, or a small flock of them. More numerous in such places is the Wilson's snipe, one of the favorite game-birds. It will flush from the grass before us, sometimes quite close, and dart off rapidly, with a peculiar squeaking cry. The best inland region for shore-birds, however, is the Mississippi valley and adjacent districts, through which there is still a considerable migration, both in spring and fall.

In meadow or morass the rails become much more abundant than in summer, particularly in early autumn on frosty mornings, and even into October. As we wade about, they flutter up feebly before us, with dangling legs, looking like young birds that can hardly fly. They only fly a few yards and then drop back into the tangle, where they run like witches, it being almost impossible to flush them again for the present. The Virginia rail can be distinguished from the sora by being slightly larger, with a much longer bill and reddish-tinted under-parts. The American coot and the Florida gallinule are mostly seen swimming in some wet morass among the reeds, or on a marshy pond among lily-pads. In wading the bogs in autumn one will flush the American bittern more often than at any other time, and also the green heron, and see the solitary great blue heron, an enormous bird, flap warily off beyond gunshot.



Breeding colony of Royal and Cabot's Terns, Louisiana, showing the use of umbrella tent.
—pp. 177-9

To speak of the swimming birds, there is probably no more familiar sight in this line than to see a grebe, or a small, scattered party of them, bobbing around in a pond among the lily-pads. Most persons call them ducks, but one can readily distinguish them by their practice of frequently diving and remaining about a minute under water. It is a very pretty sight to watch them. Two kinds are ordinarily seen in Eastern waters: the little brown fellow with a bill like a hen is the pied-billed grebe or dabchick; the other is the horned grebe, which in autumn has a white breast, but in spring quite a gay plumage with noticeable tufts of reddish-brown and black on the head.

In the longitude of the Dakotas we find the western, Holboell's, and eared grebes nesting in the sloughs. The advent of the great loon and the somewhat smaller red-throated loon into the larger ponds or lakes is a not uncommon and interesting event. How wonderfully they can swim and dive, and what strange sounds are the laughter-like cries! Almost any of the numerous species of the ducks are liable to stop in the larger lakes, or even the smaller ponds. In the hunting season the gunning-stands keep pretty good track of the occurrence of the various ducks, but in the spring hardly anyone is watching for them and they slip through largely unnoticed. Persecution has rendered them so shy that they are, in populous parts of the country, very timid about showing themselves.

The best way to see wild ducks inland in fall is to watch in a gunning stand with the hunters and their

live decoys. More ducks are shot just at daybreak than at any other time. This involves either sleeping in the "bunk-house" or rising very early and going out when it is dark. In the latter case one must enter from the rear and not be seen by ducks which have come in. Evening dusk is also a good time, when the ducks begin to fly about to feed. In the East our common staple at such times is the dusky or "black" duck, with a smattering of wood duck, mallard, pintail, blue and green-winged teals, ruddy duck, redhead, and less frequently the shoveller, baldpate, gadwall, bufflehead, canvasback, or others. In the West and South most of these are much more common. The flocks of Canada geese are due in late October or early November.

The sea-coast, of course, gives much the best opportunity to see the migration of water-birds of nearly all kinds. Shore-birds are a delightful group. What is finer than the sight of a flock of sandpipers, chased by the surf, scurrying up the beach, or the band of plovers or curlews feeding on the salt marsh or flat! Unfortunately most of them have been shot off, and the larger kinds are seldom seen. It is a crime against Nature which makes the blood of the bird-lover fairly boil. What right have ignorant, thoughtless people to exterminate our bird-life! If hunting cannot be regulated, better no hunting at all, for there can be none anywhere when the game is all destroyed. The question now is how to save the

remnant and secure its increase back to normal abundance.

To mention a few of the shore-birds which one is likely to meet, the most numerous are some of the sandpipers, especially the little semipalmated sandpiper, which one will see in flocks on beaches and flats. The least sandpiper resorts more to marshes, but both go together at times. They are hard to tell apart at a distance, but the latter is smaller, browner, and has no partial webs between the toes. With these are often a few white-rumped sandpipers, distinguished by what the name implies. The sanderling is a larger species, quite pale in color, but not as much so as the little piping plover which races along the beach, almost the color of the sand. All plovers, too, are stouter in build. The turnstone prefers stony shores.

The knot is the largest sandpiper, a beautiful bird with pencilled markings on its back. The pectoral sandpiper, distinguished by a heavily marked breast from the sanderling, though of the same size, prefers the salt marsh, as does the dowitcher, which latter will attract instant attention by its very long straight bill. The two species of yellow-legs are also birds of the marsh. The main difference between them is one of size, and both have long yellow legs and show a white rump as they fly. Their clear piping calls, consisting of three or four quickly-repeated, resounding whistles, are very striking and easily imitated, by doing which the birds are very easily decoyed. The

willet is another large wader, with white bars on its wings. Occasionally a Hudsonian curlew appears.

Of the plovers, the little ring-neck or semipalmated plover is by far the most common, to be found on flats and beaches. The large black-bellied plover, while not really rare, is too good eating to be abundant, as it formerly was. It is especially fond of muddy or sandy flats and is extremely shy. Its near relative, the golden plover, is scarce now on the Atlantic coast, as it has learned to migrate in the fall from the Maritime Provinces straight south over the ocean, to make its wonderful and famous flight to Argentine and Patagonia. Some, however, are deflected in to us in late August and September by easterly winds or storms. During the autumn of 1909 more of them were observed and taken about New Haven, Connecticut, than for many years, suggesting that protective laws may be having real effect.

The best way to see the shore-birds in these days is to make a trip south in spring. Quite an army of this tribe pass along the coast of the Carolinas. But to include the golden plover, the trip should be to the Louisiana coast, especially in the delta region of the Mississippi River. For an autumn trip, and not a very distant one either, try the east shore of Nova Scotia, anywhere along the Cape Sable region. On Cape Sable Island and the adjacent Barrington passage there are still fair numbers of shore-birds at times in August and September. On the shores of New

England and the Middle States shore-birds are pretty scarce, though on Cape Cod, Nantucket, and Long Island there are some to be seen, especially during and just after an easterly storm.

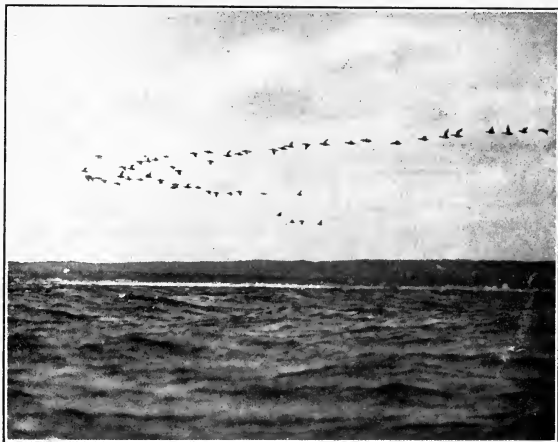
In August and September it will abundantly repay one to take a trip with a fisherman well off to sea southeast from Chatham, Massachusetts, on Cape Cod, or eastward off Cape Sable Island, Nova Scotia, to observe the birds which live on the open ocean. It is not necessary to embark on an extended voyage. Just hire a sail-boat and run off shore from five to ten miles. The numbers of birds will depend upon where the schools of bait-fish happen to be, but on many days there will be birds, and frequently hundreds of them. There we are more than likely to see plenty of Wilson's petrels, and numbers of greater shearwaters, some of the sooty, and possibly a few Corey's shearwaters. These are all wonderful birds, that breed in the Antarctic regions, and during their winter, which is our summer, wander over our part of the ocean.

In August the jaegers arrive from the North, and, chasing the terns, make them disgorge their fish, often catching it in mid-air. Of these there are the Pomarine, parasitic and long-tailed species. About the middle of August the little northern and red phalaropes migrate down our coast out to sea, and may be encountered in flocks, feeding on drift-weed or flying along. Such a trip is perfectly practicable and one of the most rewarding of ornithological ex-

periences, because of its novelty. Have the skipper of the boat provide fish-livers to toll up the birds. Crumbling the bait up fine, it should be dribbled out astern as the boat sails, and, if there are any birds within miles, they are almost sure to follow up the boat and give great chances for pictures with the reflecting camera.

In October, when the migration of wildfowl is at its height, I would suggest a trip to some one of the projections of land past which the fowl are accustomed to fly each year. There the gunners usually shoot from a line of boats at the passing flocks, anchoring off at daybreak, a gunshot apart. Some days, particularly if the wind be at all easterly, thousands of fowl go by, mostly very early in the morning, but to some extent all day. Here one may see the three kinds of scoters, both the scaup ducks, the red-breasted merganser, oldsquaw, eiders, golden-eyes, and occasionally any of the ducks, also the brant, loon, red-throated loon, various gulls, jaegers, cormorants, gannets, sometimes auks, puffin, guillemots, or flocks of Holboell's or horned grebes.

One does not see all of these each day by any means, yet in the course of various trips I have seen them all and others. Such outings are certainly interesting and exciting. For places to go I suggest Manomet, Cohasset, and the vicinity of Cape Ann, Massachusetts, and Cape Sable, Nova Scotia; there must also be many good spots on the coast of Maine. Points at least as far north as Maine have the ad-



Scoters, or "Sea-Coots," migrating. The photographer was almost blown out to sea while securing this picture.

—p. 164



Turnstones. Surprised by crawling through marsh-grass.

—p. 160

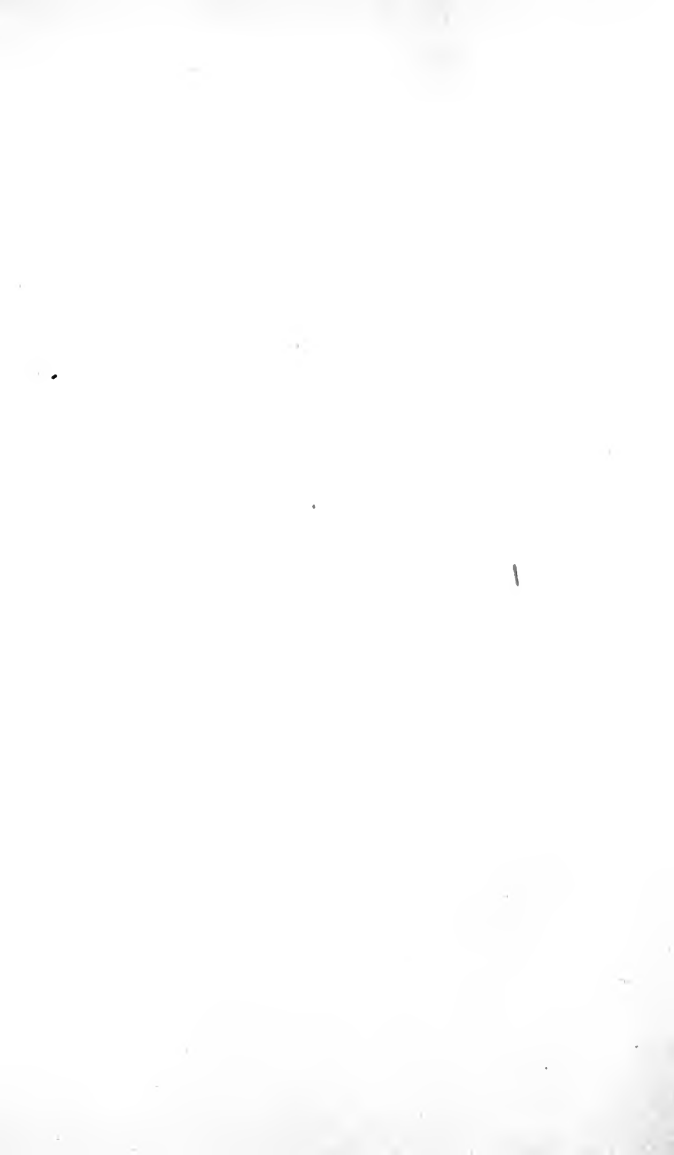
vantage that certain species can be seen there which hardly ever come as far south as Massachusetts, notably the auk family, and some ducks like the king eider and harlequin. The latter are common off the coast of Maine in late fall and winter, but are rare farther south.

The most satisfactory way in these days to gain intimate knowledge of the seabirds is to visit the colonies protected by the Government and the National Association of Audubon Societies. While these must not be allowed to become tourist resorts, students who are responsible persons can secure permission to visit them under the guidance of wardens. They must not keep the birds off their nests or frighten the young into the sea, yet, with very little trespassing upon the privacy of the birds, wonderful sights can be gained. Such a place as Great Bird Rock, off the coast of Newfoundland, in the Gulf of St. Lawrence, will repay any effort to reach. The spectacle of those thousands of birds sitting on their nests on the edges of the cliffs or swarming in the air, while the surf thunders against the rocks below, will cause one to thrill every time it is brought again to mind. The best time to go is in July, when there are both eggs and young. The birds have mostly laid their eggs by the middle of June.

It would take too much space even briefly to describe or characterize all the water-birds, but it is hoped that the few hints in this chapter may be enough to stimulate some interest and give at least

a start. Such birds as the warblers are exquisitely beautiful, but to the birds of water and ocean there clings a special glamour of the wild which is very fascinating to those who feel at times the spirit of hardihood and adventure luring them afield and afloat.

CAMERA HUNTING AND EQUIPMENT



CHAPTER XIII

CAMERA HUNTING AND EQUIPMENT

HUNTING with the camera has in recent years come into great vogue as a sport and an adjunct to outdoor studies of nature. From the sportsman's standpoint, it provides a real hunting, in which there are no closed seasons, making all wild creatures legitimate game, instead of a limited few. Viewed from the province of the collector, the acquiring of interesting and valuable pictorial trophies satisfies the almost universal passion for "making a collection" of some sort. As a method of scientific research, it is valuable in many different ways. All in all it is a most fascinating employment, with all the freshness of the open, from which no age or sex is debarred. Some aspects of it are difficult, yet not so much so as to be beyond the reach of any who are in earnest. My purpose is to give such directions and suggestions, simply and yet in sufficient detail, that anyone who wishes may be able successfully to take up this "new hunting."

At the outset, it is important to secure the right type of camera, one which is adapted to the work in hand. It cannot be too strongly impressed upon the mind that the ordinary snap-shot camera, with single

lens and fixed focus, or those which do not allow of focusing upon a ground glass and require one to measure or guess at the distance are almost worthless for this purpose. Occasionally one might happen to secure a good picture, but it is a heavy handicap. It is hard sometimes to have to inform an inquirer that his much-advertised affair will not fill the bill. Nor is the particular "make" important, so long as it is of a type adapted to do the work.

There are two types of cameras necessary for the fullest success in this work, for different classes of subjects — first, for general purposes, the ordinary long-focus instrument, and then, for certain special work, the reflecting type of camera. The beginner should first secure the former and learn to use it. Then, if he or she wishes to go farther, the other may be acquired.

The best all-around instrument for general purposes is some well-made focusing camera using the 4x5 inch size of plate, of light weight, with not less than sixteen inches front "draw" from plate to lens, preferably a little more. This length of bellows will allow the use of single lenses of the doublet, or of a telephoto attachment. Instruments that have back draw have longer bellows, but are heavier than is necessary. The lightly-built "cycle" models answer every purpose, and the matter of even a pound or two is important when it comes to all-day tramps, floundering through bogs, or ascending tall trees.

As to size, the 4x5 is the best for active field-work,

and is the size preferred by most workers. Anything less is too small. The 5x7 is better for scenic pictures, but is unnecessarily cumbersome for work in trees, as it is hard to screw up rigidly so heavy an instrument. Furthermore, owing to the usual difficulty of getting very near any wild bird, one can seldom secure an image of the subject large enough to anywhere near fill even a 4x5 plate. A good sharp image of a bird even half an inch long with good detail can be successfully enlarged almost indefinitely. I often secure, for framing, very clear and good 11x14-inch enlargements from 4x5 negatives.

The reflecting camera, with its ingenious mirror arrangement for seeing the image of the game up to the instant of exposure and its extremely rapid curtain-shutter, is the only instrument adapted to securing pictures of birds in flight or motion, or by stalking. Further details of this will be found in another chapter.

As to the lens, it must be of the doublet type which requires careful focusing. It should be of the largest size and longest focus which will allow the use of the single lenses of the doublet with the length of bellows or "draw" of the camera. The longer the focus of the lens, the larger will be the image of a bird secured at a given distance. Each single lens of a doublet gives about double the size of image of the bird, from the same spot, as with the two in combination, but the time of exposure has to be about four times

as long as in the latter case. The usual rule is to buy a lens of the next size larger than the one ordinarily sold with the camera. A 4x5 camera, such as I have recommended above, will allow the use of the lens doublet and its members designed for the 5x7 size; for the latter size the lens for the 6½x8½ instrument will be all right.

A little inquiry will disclose the fact that some lenses cost a great deal. These expensive ones are of the type called anastigmats, or corrected lenses. They allow of a more rapid exposure than the others, and give very sharp detail in the picture, even when used at full opening, without being stopped down. For the general camera, of the type first mentioned, an anastigmat is not essential, though it is a good thing to have one if possible. Any good ordinary commercial lens will do quite well, though it is slower. Much of the work is with timed exposures, at small aperture of the lens, which of itself insures sharp detail. To test a lens, focus upon a general view and examine the image on the ground glass. If it is not clear and sharp to the very corners, the lens will not do. When it comes, however, to rapid snapshots with the reflecting camera, a rapid anastigmat is very desirable. By purchasing American makes or watching for exchange bargains one may save a good deal of money.

Some anastigmat lenses which are advertised as extremely "fast" gain rapidity at the expense of length and depth of focus. The longer the focus the greater

will be the image of the "game" at a given distance and the more objects will be in focus at the same time at varying distances from the camera, both of which matters are of great importance. On the other hand, the longer the focus, or the farther away the lens is from the plate, the less is the illumination and consequent rapidity. But extreme rapidity is dearly purchased for this work at the expense of depth of focus, and it is better to be content with a medium rapidity, which is quite ample. The doublet of a 4x5 size should not be of shorter focus than six inches, and that of the 5x7 at least seven and a half inches.

A good plan, if one gets both types of cameras and does not care to buy two lenses, is to secure an anastigmat and use it interchangeably in both. The lens-flanges on both cameras should be duplicates, and the transfer can be made in a moment.

There is another lens which is sometimes useful in conjunction with the regular lens, the telephoto attachment. This is screwed on to the doublet lens and has a telescopic effect, increasing the size of the image made by the doublet from six to eight diameters, as desired. It must be fitted by the manufacturer or optical expert to the particular lens in hand. It is an instrument of only occasional utility, and very difficult to handle successfully. Directions as to its use will be given in the next chapter.

The general camera should be carried in a leather case which is slung over the shoulders by straps. In this carrying-case there should also be a compartment

to carry six double plate-holders. The reflecting camera is heavy and can most easily be carried in hand by the handle on top. I have never used a case for this, as it involves too much extra weight.

If possible the plate-holders should fit both the general and reflecting cameras interchangeably, for it is a great advantage to be able to apply one's whole stock of plates afield to either or both cameras at will. Sometimes, especially on expeditions to strange and distant places, I have fallen in with game which required the use of one or the other type of camera exclusively, and many plates. To have the holders interchangeable under these circumstances practically doubles the stock. Most dealers sell a special holder with their camera, probably through business necessity, but some of these will fit others.

The number of plates to be taken afield on a day's jaunt will depend altogether upon probable need. On a long walk when hunting for new material, especially when no subjects have been found in advance, the dozen plates in the carrying-case of the camera will usually suffice. In colonies of water-birds I sometimes use sixty plates in a day, and thus have thirty holders. The extra ones are carried in another carrying-case, with the overflow from this in a creel, wrapped in a dark cloth.

The only plates which should be considered for this work are those of the maximum rapidity. The Lumiere Sigma plates are the fastest I know of at present, and are splendid for extremely rapid exposures

with the reflecting camera. The American plate, made in Worcester, Massachusetts, is excellent, fast, and cheap. The quickest grades of Seed, Hammer, Cramer, and Eastman plates are also first class.

As between plates and films, I find plates generally preferable, being faster, cheaper, and easier to manipulate. Their weight and liability to breakage are the objections, but I do not consider that these outweigh the advantages. With careful handling and packing I have never had a loss through breakage, though sometimes on expeditions requiring many plates I have paid express or excess baggage. For the slower exposures, films will answer, if one cares to pay the price, but one should use cut films, and not films in rolls, so as to be able to give each exposure separate and careful treatment.

That the tripod and focus-cloth are needed accessories almost goes without saying, yet there are a few suggestions to make even about these. The tripod must be carried about with the general camera, hence it should be of light weight, yet not so fragile that it will not be practically rigid. It certainly must be firm if one would do successful telephoto work. Preferably it should fold in four sections rather than three, so that it can be transported in a suit-case. It is well to have it of some dull, inconspicuous hue, and not to have the metal parts bright and shiny. The focus-cloth likewise should be of a dull color, such as a nondescript brown, at least on one side. It should be waterproof in order that the camera when left set

for a timid bird may not be injured by rain. Such a cloth also is very much needed when one is caught in a shower to cover things up. The rubber-washed ones soon get leaky, yet two leaking ones afford considerable protection.

A very important piece of apparatus is something with which to fasten the smaller camera in a tree, or on a ladder or building. A shawl-strap arrangement can be used in many cases, though it seems to me rather cumbersome and liable to slip. The best arrangement I know of, and which I use, is a very simple one devised by an ornithologist, the Rev. P. B. Peabody. It is in two parts, the first of which consists of an ordinary carriage-bolt about a foot long, with a screw at one end, bent in the middle at right angles. At the end opposite the screw should be glued a pad made by wrapping leather about the last two inches of the shank.

The other part is what is known as a camera bicycle-clamp, a ball and socket arrangement. In the metal ball a tripod-screw is inserted which screws into the camera. The clamp grips the ball and also clamps around the bicycle handle or any other rod. In using the instrument the screw-bolt is driven into the tree firmly, and the ball and socket, with the camera, is made to grip the pad at the end of the rod. Further details as to its use will be given presently.

In connection with this arrangement one also needs a "goose-neck" device to use on the camera, so as to be able to point the latter at any angle up or down.

One will readily see the need of it when trying to focus the camera without it on a ground nest, or on something near it. Mr. Peabody's device is to use the same ball and socket clamp as above, and, instead of the screw-bolt, a shorter round iron rod, about six inches long, bent in the middle at an angle of forty-five degrees. One end should be flattened, so the thing will stand firmly on that side, the other pointing up at the aforesaid angle.

Near the end of this flattened part a hole should be bored, with a thread cut to correspond with the thread of the tripod screw. At the other extremity of the rod should be put a pad like that of the screw-bolt. Then one screws it to the tripod, and with the clamp attaches the camera to the pad, and it will be found possible to aim in absolutely any direction. There are other devices on sale, but I have seen none so light, convenient, and simple as this combination for both tree and tripod work.

There is one other article without which the equipment is incomplete,—a hiding-tent, to conceal the camera-hunter while doing certain kinds of work. It is wonderful how the shyest birds can be so deceived as to utterly ignore such a device. I have sat in one in a colony of herring gulls and had the birds actually brush their tails and wings against me, separated from them but by the thickness of the cloth, as they walked to their nests. Had I sat there uncovered, not one would have come anywhere near the nest.

Various tent devices have been described, but the

general principle in all cases is the same. I am using the umbrella-tent arrangement as first described by Mr. F. M. Chapman, which can be made by anyone as follows: Get a strong umbrella of good size, say with the ribs about three feet long, with a wooden handle. Cut off the knob or crook, leaving a straight round shaft projecting a little beyond the ends of the ribs. At a machine-shop have a sliding arrangement made, similar to that used in a music-rack, consisting of two hollow metal tubes, each about a yard long, one of which slides into the other. In the outer one, several inches down from the upper end, a hole should be cut for a thumb-screw, so that the rack may be extended to any desired degree. Shave off the end of the umbrella-handle so that it will fit snugly several inches down into the upper end of the tube, above the thumb-screw. Out of hard wood make a pin, ending in a point, the other end fitting firmly into the bottom of the tube. This is to insert into the ground to hold up the rod with the umbrella.

Now for the tent part. Out of strong, unbleached cotton cloth have made a crude tent just the size and shape of the umbrella when spread and just reaching to the ground when erected high enough to enable one to kneel. With hip-boots one can kneel on wet ground. If in water, the rod can be lengthened so that the bottom of the tent will just reach the water, and, say knee-deep in water or mud, one can stand erect in it. It is easy to cut the cloth for the tent

by eye when the umbrella is set up outdoors at the desired height. There may be loops at the bottom for tent-pins, and it may be fitted with guy-ropes, but I have always got along without these by piling sticks, stones, or sand on the flaps, and, instead of guy-ropes, using branches or poles, or propping it up among bushes or rushes. On beach or marsh there is usually driftwood available.

The color may be changed at will. According to where it is to be used it may be brown, green, or gray. To color it, I set it up, and daub on the dye with a white-wash brush, making the color darkest at the top and quite light below, according to the now recognized principle of protective coloration. For peek-holes, simply cut small slits or square holes with knife or scissors, as desired, leaving the flap hanging so that it can be pinned together again upon occasion.

Not all of these implements will be in use at the same time, but they are all useful at *some* time, and on a trip or expedition they should all be taken, or one is liable to be handicapped at an important juncture and perhaps robbed of a crowning triumph by the lack of one of these articles.

USING THE ORDINARY CAMERA

CHAPTER XIV

USING THE ORDINARY CAMERA

BEFORE we fly we must walk. The beginner in hunting with the camera must not expect to start right out and secure difficult spectacular pictures of birds in flight, or become disheartened because he cannot. This will come in time, and meanwhile each step has its interest and fascination.

The first thing to be done is to learn the elementary principles of photography, both as to the taking and the making of the picture. By all means do the whole thing yourself, as part of the sport; develop your own plates, print your own pictures, and make your own enlargements and lantern-slides if you want them. One learns through working out the processes how to improve the work. Hiring things done gives little stimulus to the mind and is apt to keep one in the ranks of the bungling snap-shotter. There is a real excitement in watching the image appear on the plate in the dark-room which is almost as vivid as the experience afield in securing a fine "shot" or exposure. So secure an elementary book or pamphlet on photography, and try first of all some ordinary landscape pictures.

Though this book must not be a treatise on pho-

tography, I will give a few hints about some practical matters which have a special bearing on this department. The main thing we are to try for is to secure clear, sharp, detailed pictures of the wild bird or animal in life, as well as of other natural objects, and not the blurry monstrosities which some people are pleased to consider "artistic." Learning the proper length of the exposure will give some trouble at first, but with the help of published tables, or of "exposure-meters," this will soon cease to be a problem.

A developer which works slowly and gives brilliancy is the most easily controlled and the best for the beginner. Hydroquinone is good to try first, but certainly not pyro, which, though often recommended, is dirty and troublesome to handle. Do not take the plate out of the developer when the picture looks best on the surface, but leave it in till the image shows clearly through the glass side of the plate, even if the surface picture seems to fade away into utter blackness. Such darkening shows too long exposure, but it will only make matters worse to take it out before the image has formed clear through the coating on the plate.

This over-exposure can be remedied, as under-exposure cannot, in the following way, which is worth knowing: If the plate is very black and dense, yet with a clear image, as seen by holding it before a strong light, put it in a reducing solution of red prussiate of potassium and hyposulphite of soda until it thins down to just a good printing density. This



Nest of Whippoorwill. Easy to see eggs when bird leaves them.



Whippoorwill on nest, showing protective coloration.

will strengthen the contrasts somewhat. If it needs more contrast, make the best possible print on contrastive glossy Velox, or similar developing paper, and then photograph this print, developing for contrast. The result may be a very fine printing negative. In this way valuable subjects may be saved and shown to the best advantage.

When one has learned to make a fairly good landscape picture, it is time to begin on the easier sort of bird-subjects. The best for first attempts, if the season is right, are the nests of birds. The sort of a bird's-nest picture often produced by the beginner is the puzzle-picture, where one has to hunt for the semblance of a tiny nest in a mass of foliage, in all of which there is probably little detail, only staring black and white, caused by under-exposure, bad lighting, and poor choice of position.

Perhaps the best way to explain what to do is by a concrete case. Late one cloudy afternoon in June I was walking through a patch of woods on a side hill up from a road when I flushed a veery, or Wilson's thrush, from the ground just ahead of me and found its nest with four plain blue eggs, which I proceeded to photograph. It was located very prettily among some plantains and other weeds, with taller undergrowth arching over it. The latter I bent back temporarily out of the way.

Choosing a position from which the nest and eggs were in full view, with the foliage conveniently and prettily disposed, taking pains to disturb the sur-

roundings just as little as possible, I set the camera on the tripod so that the lens would be about a yard away, as I remember it, from the nest, pointing down at an angle of about forty-five degrees. This would be difficult to manage without the "goose-neck" device described in the preceding chapter, and I used it. Then I focused sharply and got the nest about in the center of the picture, a little nearer the bottom, yet not so near but that there would be some foreground. Next the aperture of the lens was stopped down to about F30.

The nest was wholly in the shade, which was proper. Had it been in direct sunlight, it would have been necessary to shade it by stretching out a coat or focus-cloth over it. The photographic effect of a nest in glaring sunlight is very bad. The eggs, no matter what their color, will print staring white where the light strikes, and black on their shaded sides, and, if spotted or marked, the markings will not show. This is particularly true if a snapshot should be attempted. Even worse is a patchy light, when the subject is partly illuminated and partly in the shade.

The next thing is to decide upon the proper time of exposure. A rough estimate would be something like this. In a fairly bright, diffused light, yet not in direct sunshine, at a moderate distance, with lens wide open, about one second would probably be right, with green foliage surrounding, which makes the light somewhat non-actinic. Half that or less would do

with little or no green or yellow near. At such close range as a yard the bellows must be racked out, which diminishes the illumination, so we will call the time two seconds. But the lens should be stopped down. Of the lens which I used, $F7\frac{1}{2}$ was the scale-value wide open. Halving the aperture quadruples the time of exposure. $F15$ is half of $F7\frac{1}{2}$, so at that stop the time would be eight seconds, and at $F30$ it would be thirty-two seconds, or half a minute.

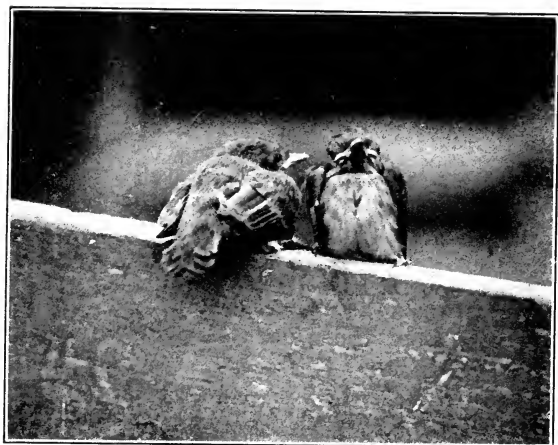
In this case, however, it was almost evening, heavily clouded, under trees and bushes, and very dark. So at a rough guess I multiplied the time again by four, making it two minutes, which proved to be just right. Stopping the lens down brought practically all the foliage into focus, as it would not have been at full opening, besides giving more perfect detail. When there is wind and the leaves move, it may be necessary to make some sacrifice of definition and use a larger aperture, not larger, however, than $F16$. The subject can be shielded somewhat from the breeze by holding a coat to windward, or else we can wait for a lull, or come at a more favorable time.

Within a few days the eggs hatch, and this introduces us to the work which naturally comes next in order, the photographing of young birds. The young of precocious tribes, as the gallinacious birds, shore-birds, ducks, and geese, are born clothed and able to run or swim, but those of the ordinary small birds are naked and ugly at first. They grow rapidly, however, and by about the tenth day are able to

leave the nest. About seven or eight days old is a good age to photograph them, before they are quite old enough to flutter away, and yet are nearly fledged.

The problem now is quite a different one. There can be no long exposures, for the young are in almost constant motion. The camera should be set as before, focused on the nest, the diaphragm wide open, and the shutter set for the briefest exposure consistent with the amount of light. It may be possible to photograph them in light shade by watching for an instant of stillness, and squeezing the bulb at the opportune time for an exposure of a quarter or half a second. Otherwise one must temporarily bend back the foliage and let in the direct sunlight, when everything is ready for the exposure, which should be "instantaneous," the shutter set at perhaps one-fiftieth of a second.

Besides photographing the young in the nest, one can secure portraits of them by posing them on a branch in bright light close before the camera, using the most rapid exposure. Do not keep them long in the hot sun. When they are about old enough to leave the nest, they will flutter out at the least alarm, and it is very hard to make them stay on a branch, so it is well to do this before they reach the age of wildness. If they must be photographed at this stage, there is no harm in tethering the youngsters with soft thread, tying a knot that will not tighten and bind the ankle as a slip-noose would. When returned to the nest, hold something over them for awhile till they



Young Phoebes.



Song Sparrow finally caught leaving nest.



get over their alarm, else they will immediately flutter out.

Often one will come across a youngster out of the nest, able to fly just a little. If possible photograph it as first found, without disturbing it, for then it will often stand perfectly still, whereas if it is handled there will ensue a constant struggle to escape and it is a hard task to photograph it. If tethered it will make repeated efforts to get away, but at length, tiring, it will remain still.

The finding of nests gives the best of opportunities for photographing adult birds. Some few birds while incubating are so tame that they will remain on the nest and let us photograph them at will. The woodcock is the best subject of this sort. The mother bird will sit like a rock, and even let one handle her. Some small birds will remain if one approaches very slowly and silently, making no quick motion. Thus, for instance, I have photographed the red-eyed and white-eyed vireos, wood thrush, chippy, chestnut-sided warbler, cuckoo, rose-breasted grosbeak, and others. Generally one must use the single lens, to get the picture from farther away, as the bird will seldom let one get very close. Even thus the picture usually needs enlargement. Here one could use the telephoto, but amid foliage it is hard to see through it to focus, and it lacks depth of focus, unless considerably stopped down, when it is very slow.

Ordinarily it is necessary to leave the camera set

and retire into hiding, releasing the shutter by a thread when the bird comes back to the nest. Be sure to have a shutter adapted to thread release, with a small lever to pull down and a hole in it for the thread. Exposure by thread is better than by pneumatic tube, which last arrangement introduces all manner of troubles, too numerous to describe. There is no trouble about the thread tangling, if one will take reasonable pains to lay it out properly. In making the exposure be sure not to jerk the thread, but give a steady, gentle pull.

Most birds are afraid of a camera set near the nest, and some will not go near it at all. But most of them will return before long, if the instrument is properly disguised. I carry with me dull green and brown hoods of thin cambric with which I can entirely cover the camera, with a hole cut in each to fit tightly around the lens-tube. In addition to this I deck the camera with leaves or grass, and in like manner conceal the tripod. Where it is feasible, I avoid using the tripod by employing the tree-apparatus, screwing the camera to a branch or tree-trunk. Where the bird is shy, use the single lens and thus have the camera farther away. If the bird is to be taken before she enters the nest, the exposure must be a rapid one, in full sunlight.

Most plates are hardly sensitive enough for instantaneous exposures with the single lens amid green foliage. But when the bird settles down to incubate or brood, she will often keep still during a timed

exposure, though she is liable to flush at the sound of the shutter. If the nest is in the shade, wait till the bird has become perfectly quiet, and have the shutter previously set for a timed exposure. Most cameras do not have a shutter-movement of more than one second duration. If I wish a prolonged exposure, I set the shutter at B, or "bulb-release," and then, steadily pulling the thread, hold it taut, which will keep the shutter open until let go.

When birds are feeding young in the nest they afford the best opportunities for interesting pictures. At this time they are more willing to approach the camera than at any other. Their movements are very quick, so the exposure must be rapid and in bright light. This involves often the temporary opening up of the nest to the sunlight, and it should not be done at a scorching hot time, particularly if the young are featherless. Better not get the picture than to inflict suffering. Wait till the young are becoming fledged, and select a time when the temperature in the sun is comfortable. In hot weather do it early or late in the day, and do not keep at it too long. When the sun is low, the interior of the nest may be in shadow, and the young will be shaded till they rise up to feed, or sometimes one leaf will shade the young, while on the branch where the parents will come the light may be good.

When the young are seven or eight days old is a good time to pose them on a branch before the camera and take the parents in the act of feeding them.

Not all birds by any means will return under these circumstances. Many kinds I have not tried to see whether they will or not. Some warblers and sparrows, for instance, make good subjects, and some individuals of the same species are better than others. These feeding scenes often prove very comical,— the parent lugging a fat worm or shoving it down the throat of a struggling youngster. Some birds are so intent upon feeding their offspring that they pay no attention to the camera, even when it is not concealed in any way and stands within two feet of them. Yet it is well to make matters easier by concealing it all we can.

The photographing of birds or their nests in trees is almost a department of the sport by itself, especially if the camera-hunter must make a difficult climb. Certain classes of birds, such as large hawks, owls, crows and herons, usually choose lofty situations, often hard to reach. One needs a pair of climbing-irons for this work, and good training in the use of them. It is a good rule not to ascend difficult trees in the woods alone. When there is good holding, or the climb is easy, I often do it alone, but not when there is any danger. Better come again with help, or even wait for another subject, than be foolhardy. At the best it needs care and coolness to cling to a lofty perch and manipulate the camera. Some nests, particularly of small birds, are built near the extremities of slender branches and are inaccessible.

Suppose we take a typical instance of the use of the tree-apparatus, which may best show how to work with it. I found a broad-winged hawk occupying the last year's nest of the Cooper's hawk, located in a hemlock tree, forty feet from the ground. Ascending, I found that it contained two handsomely marked eggs, the full set. Had the tree been an oak, with spreading forks, I could have rigged the camera in the same tree, preferably about six feet away, as these nests are large platforms of sticks, big enough to more than fill the plate unless one can get well off. In the hemlock, though, one must stay by the main trunk, and a picture of the nest from directly above is very unsatisfactory. So I climbed the next tree, about six feet away, and, tying up the focus-cloth on the farther side of it, on a level with the nest, left it for a day or two, that the shy bird might become accustomed to the strange article. When I returned she was on the nest, showing that she was ready to be photographed.

The next thing to do was to screw the bolt into the trunk of the tree on which I had left the cloth, a little above the level of the nest and at right angles to it, the padded end of the shank away from the nest, but so that this arm would point directly at it. Then I clamped the camera to the pad, aiming it at the nest and allowing the front end to rest upon the front shank or arm of the bolt. Having aimed and focused, I tied the camera in that position with a cord so it could not budge and inserted the plate-

holder. Instead of simply photographing the nest and eggs, my plan was to have the old bird in the picture as well. So I tied my thread to the shutter, and dropped the spool to the ground. Then I removed the slide from the plate, and covered the camera with the dull green cloth, decking it further with sprays of green hemlock.

Last of all, making sure that the lens was not covered, I set the shutter for an exposure of one-half second, at full aperture, as the nest was in light shade, and in the descent was careful not to touch the thread and spring the shutter. Finding the spool, I passed the thread behind a small branch, so that the pull on the shutter would be directly downward, and laid out the thread carefully for about a gunshot to my umbrella-tent, which I had previously pitched before approaching the nest. I put the spool in through the peek-hole, then tramped noisily out of the woods, and presently sneaked back quietly into the tent.

For half an hour or more all was silent. Then the hawk began to scream and fly around, inspecting the new situation. Finally she alighted on the edge of her nest, and stood there motionless, looking and listening. This was my opportunity, and gradually, without jerking, I pulled the thread taut. The hawk was not alarmed at the slight grating of the shutter, though she turned her head after it had closed, and entered the nest. I let her stay there awhile to become confident, and then flushed her by



Broad-Winged Hawk entering nest. Illustrates photographing in trees.
—pp. 193-5



climbing to change the plate. Next time she did not stay away so long, and I photographed her carrying a strip of bark to line the nest, and again when she had settled down to incubate. Then she seemed alarmed at my frequent appearance, so I withdrew, leaving the cloth there so that I might try again if the plates should not turn out to be good, which, fortunately, was unnecessary.

The above instance may suggest the general method of procedure in "tree-work." Yet in this and every other department of study and sport one must be fertile of resource in devising expedients to meet the new situations which the birds will often furnish us and which are above all rules. The following is such an instance: I was wading through an area of reeds growing from the water near the shore of a large lake in Saskatchewan, northwest Canada, finding nests of canvasback, redhead, eared grebe, coot, and other interesting birds, when I heard quite near me a most singular series of hissing and grunting sounds. Going closer, I saw an American bittern on her nest, her feathers all bristled out, scolding at me. The nest was a rude pile of stems, raised just above the water amid a thicket of reeds.

I had previously found many a nest of the bittern, but never a bittern that would stay on the nest when discovered. The bird was nearly hidden, but I set up the camera on the tripod, stopped down the lens, and got some pictures showing her among the reeds. But if those reeds were only out of the way! I

thought I would see what I could do, so very slowly indeed, raising the front leg of the tripod, I bent one reed aside. This did not alarm the bird, so I got rid of another, and another. Finally I moved one that was almost touching the bird's bill, and she actually pecked the tripod.

It took a long time, but I finally had her clear in the open, and took all the pictures I wanted, even waiting for clouds to pass before the sun, so as to secure soft detail. Nothing of the kind had ever happened to me before, and probably never will again, so it was a case of working without rule or precedent to guide. Method is but the means to an end; the main thing is to get the pictures.

As to the use of the hiding-tent, there are a few further suggestions to make. If feasible, it is a good plan to pitch it in the evening, as in the growing darkness the birds more readily become accustomed to it, and in the morning there will be little waiting after the photographer enters. Unless one can steal in unobserved, it is best to have a companion go with one to the tent and leave it boldly in sight of the birds. Our feathered friends may be wise in a way, but they do not know much about counting.

It is well known that the great blue heron is one of the shyest of birds. In a strip of low trees along a stream in Saskatchewan a small colony of them had built nests. They were so wary that, as a friend and I approached over the prairie, they stood erect on their nests when we were nearly half a mile away,

and flew off long before we were anywhere near them. We pitched the tent in a clump of bushes, decking it with foliage, and my companion departed, leaving me hidden. No sooner had he withdrawn than back came the herons, alighting on their nests, and for two hours I had the opportunity of my life to photograph the splendid birds in all their interesting poses.

While working in the tent it is necessary with some birds, particularly with herons, to guard against their seeing any movement inside. To this end I pin a cloth before the peek-hole, through a small slit of which the lens tube fits tightly. In this way the bird cannot see the hand setting the shutter. Even the lens must be moved very deliberately, and one must avoid any rustling or the cracking of twigs underfoot. Gulls and terns, on the contrary, do not ordinarily become alarmed by seeing one at the peek-hole, and they are not so sensitive to noise. With them one may sometimes use the reflecting camera in the tent, the shutter of which is altogether too noisy to use on herons. The slight sound made by the shutter which I use on my small ordinary camera seldom startles a bird by the tent.

The experience of being in the midst of a colony, with a crowd of birds close around one, is wonderfully interesting. It seems as though one were a bird oneself, accepted as a member of bird-society, and it is hard to realize that the whole thing is not a dream. This was my feeling in the midst of a great colony of some two thousand pairs of black-

crowned night herons. They were nesting in low oak trees in a strip of woods. Late one afternoon I planted the tent in a favorable spot surrounded by nests. Next morning when I appeared suddenly in the rookery there was a perfect roar of wings as the great birds departed. Before they had time to circle back I was concealed in the tent, and the birds, seeing that I had disappeared, soon returned to their nests. Some incubated, while their mates perched close by, dozing or preening their feathers. It was fascinating to sit and watch, studying and photographing their beautiful and perfectly natural poses. Those who have affirmed that photographs of birds do not show them as they are in ordinary life were not acquainted with these up-to-date methods.

On this occasion I had very good success with the telephoto lens, picking out individual birds here and there, and securing images large enough to fill the plate comfortably, so I will further describe its use. At best it is a difficult instrument to manage. Owing to the bellows being racked out so far, with the heavy mounting clear in front, it is very difficult to prevent vibration, and also to see accurately to focus when the light is not very strong. To avoid vibration, I generally cut a stick and prop up the lens. Even then, if the wind is blowing, there is liable to be movement. Its best use is from inside the tent, where everything is still, and where, removed from the sun's glare, it is easier to focus.

If the subject will allow it, the lens should be

stopped down to about F16, to secure sharp definition. The exposure must ordinarily be about one half-second in strong light, even with the lens at full aperture, and more under less favorable conditions. Hence the bird is quite liable to move and spoil the picture. In fact the difficulties are so great that I generally prefer to secure as large an image as possible with the single number of the large doublet, and do my enlarging carefully at home. In this way I get just as large a picture in the end, and usually a better one. However, in cases when it is impossible to get anywhere near certain game, such as water-birds out on mud-flats, where the image even with the single lens would be too small to enlarge, the telephoto is useful, and by careful focusing one may even secure a telephoto picture capable of being still further enlarged at home.

There are also some other ways in which birds may be photographed by the ordinary camera. From a blind on the shore one may catch shore or water-birds which come along, perhaps attracted by decoys, or simply feeding along the margin. A fruitful source of pictures in winter is to hang up suet or put out seeds, crumbs, or nuts in a spot which birds tend to visit, and leave the disguised camera focused upon the bait. A thread connecting with the shutter should enter the house through a keyhole or under a window, ready to be pulled when a bird comes to feed. Birds which are liable to come are the chickadee, nuthatch, downy and hairy woodpeckers,

junco, tree sparrow, blue jay, and perhaps others that I have overlooked.

When it comes to snapshot work, by following birds up with the camera in hand, the ordinary camera may sometimes be successfully used in an emergency by estimating the distance and using the scale for focus, and the little finder. But for this work the only satisfactory instrument is the reflecting camera, the use of which will now be explained.

SHOOTING WITH THE REFLECTING CAMERA

CHAPTER XV.

SHOOTING WITH THE REFLECTING CAMERA

THE reflecting camera is a crowning triumph of inventive skill which greatly enlarges the possibilities of hunting with the camera. The great need is to be able to focus with speed and certainty on live game with the camera in hand, and to be able to make a sufficiently rapid exposure to catch it sharply, despite any sort of movement. All this is realized in the modern reflecting camera, whose predecessor was a twin-lens or double camera, cumbersome and disappointing. In this new device there is a mirror arrangement by which one can see the image of the game, full size and right side up, until the instant of exposure. By means of a curtain or "focal-plane" shutter at the back of the camera, just in front of the plate, one can secure a fully timed exposure, in bright light, in an interval of one one-thousandth of a second, or even less. With this a bird can be photographed in the most rapid flight, fluttering, running, or in any activity.

The first camera of this sort to be made was the "Reflex" camera. The Graflex followed with improvements, notably in being able to arrange the cur-

tain-shutter from the outside, which were matched in the new long-focus Reflex. Both are excellent instruments, though of necessity rather heavy and high in price. The Naturalist's Graflex, 4x5 size, costs \$190 without lens, and the corresponding Reflex model \$100. I am still using an old model 5x7 long-focus Reflex camera which is about the weight of the 4x5 styles of both of the above, enabling me to use the larger plates when I need to for special work, though I use mostly the 4x5 plates in "kits" or frames inserted in the plate-holder.

For a long time I have been looking for a cheap, long-focus reflecting camera which I could recommend to young people and to those who cannot afford the expensive instruments. The nearest approach to my ideal which thus far I have been able to discover is a reflecting instrument made by the Hall Camera Co., of Brooklyn, N. Y. The price for the 4x5-inch size is \$30 — without lens, a remarkable drop in price. The maximum focal length at present is $12\frac{3}{4}$ inches, which is not quite enough to allow the use of a single member of the doublet. However, it can employ a 5x7 doublet, which makes it practicable for much work without using the single lens.

The firm think that at an additional charge of not over \$5 they can provide a cone-extension arrangement which will add several inches, and they are working on a model of longer focus. The camera is comparatively light, weighing hardly six pounds. It



Kittiwake nesting on cliff, Great Bird Rock. Photographed from "The Crate."



Sooty Tern incubating, Florida Keys. Photographed without any precautions

begins to look as though the long-focus reflecting camera were at last coming within the reach of the many.

It might be feared that the very rapid exposures of which the curtain shutter is capable would not have been sufficient to allow of successful development. Such fear is groundless, for, though the exposure is indeed brief, while it lasts it is at full opening throughout, instead of for a small fraction of the exposure as with the shutters used at the lens, which must gradually open and close. In exposures in open sunshine, over water, or alongshore, the light is so bright that with a slit in the curtain one-eighth of an inch wide and the spring wound to full tension, representing one one-thousandth of a second exposure, by using strong metol-hydro, or edinol-hydro developer, I secure full-timed negatives. Under ordinary conditions of sunshine, if the picture is to be of a bird flying with moderate rapidity, I suggest an opening in the curtain of a quarter of an inch. If the bird is a slow flier, like the gull, the tension of the spring may be relaxed somewhat. The lens, of course, is always to be used wide open for all this snapshot work.

At this aperture, in the case of birds flying against the sky or over the water the single lens may often be used effectually, thus securing twice as large an image of the game as with the doublet. Flight pictures of birds against dark backgrounds should only be tried with the doublet. When the bird is at rest,

the single lens may be used, with a curtain-opening of about an inch and with only a slight tension of the curtain-spring. This is about the right speed for a landscape picture, with the doublet, especially if there be green grass or foliage.

The above will serve as a suggestion for those who are beginning to hunt with the reflecting camera, but it is best, as soon as possible, to become thoroughly familiar by experience with one's own instrument. The tension of the spring will vary, tending to grow weaker as time elapses, and the speed of lenses is different. When one has learned by experience what his own camera under differing conditions will do, he will seldom make a mistake and will secure a high percentage of successful exposures.

The first thing that one will probably try to do with the reflecting camera is to attempt to walk up to birds and snap them before they fly. Even with a large single lens most birds will not wait for one to approach near enough to secure an appreciably large image. Yet there will be opportunities. Birds near their nests will sometimes boldly berate the intruder and give him some good shots. The kingbird is usually a good subject in this way, and so at times are the robin, catbird, brown thrasher, blue jay, and others. Yet individuals vary in disposition, and of the same species some will be shy, others bold.

During the spring and summer especially, if one will wander around with the reflecting camera ready, various opportunities present themselves. A robin

alights on a fence-post nearby, and various birds are always liable to come upon one suddenly, or we upon them. A few days before this writing I was standing in the road watching some migrant warblers, in October, when suddenly a Cooper's hawk flew up over the brow of a hill, and, not noticing me, alighted on an open limb a dozen feet from me. If I had been carrying a camera and had had it ready for action, I had plenty of time for a shot before the bird flew.

The warblers in spring often afford chances, if one will follow them up. For these small birds the single lens should be used, the curtain open at least half an inch and at moderate tension. Do not try the shot when the bird is in the shade unless it is still, and one can open up a very wide aperture. Ordinarily it is best to watch for a chance when it moves out into direct sunlight. Winter birds, though comparatively scarce, are apt to be rather tame and permit quite near approach. I have photographed pine grosbeaks by walking right up to them, and also the birds which come to feed at the "lunch-counter."

In a region where there are more of the larger species, especially swimming and wading birds, some very fascinating sport can be had with the reflecting camera. Either we may try to sneak up to them, or else we may hide in bushes or blind and let the birds themselves approach us. On the Florida coast I have had good success with shore-birds by hiding among the mangroves conveniently close to the water's edge

and letting the birds feed along past me. Herons feed on the margin, and can sometimes be closely approached under cover, as can wild ducks. In these cases the shutter should be prepared for a rapid exposure, in case the subjects should take to wing. The single lens may be used if the subjects are to be on or over the water. Unfortunately all curtain shutters are rather noisy, and the first shot is liable to frighten away the game. Sometimes, though, especially if the wind is blowing or waves are breaking, birds do not notice the sound of the curtain, and in this way I have secured shot after shot at shore-birds.

On certain off-shore fishing-grounds very exciting sport may be had at times by baiting up the sea-birds around a sail or power-boat and photographing them. The best accessible places that I know of are about five miles southeast of Chatham, Massachusetts, and about the same distance off Cape Sable, Nova Scotia. If one should be on a fishing schooner on the Georges or Newfoundland Banks it would be even better. Various ocean birds such as petrels, shearwaters, and jaegers are often flying about searching for food. One should be provided with fish-livers, which can be crumbled and dropped astern, with the boat under slow headway. The birds soon follow up the greasy trail, and there will be splendid sport and probably results worth while.

One must not be discouraged if fog, wind, rough sea, or the drawing of the birds elsewhere after schools of fish render many days' efforts unavailing.

The trophies would become too common if everyone could secure them without effort. Midwinter is also an excellent time to do this, for the auks, guillemots, puffin, kittiwake, sea ducks, and other hardy fowl. In the Christmas holidays I have seen the ocean off Chatham fairly alive with these varieties, but it is hard to get outside the dangerous harbor-bar.

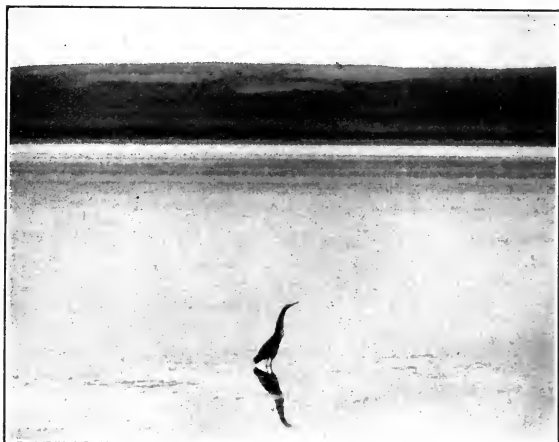
In visiting colonies of water-birds, the reflecting camera is indispensable. The ordinary shutter is too slow for the fluttering multitudes, but with the mirror arrangement and the curtain shutter wonderful results can be obtained. In such resorts one needs both cameras — the reflecting one for flight pictures, and the other for studies from the tent, though in some cases the first can also be used there, if the birds do not mind the sound of the curtain. The single lens will be found very effective for picking out individual flying birds from a flock, or small groupings of them, for wing studies.

It is somewhat bewildering to watch the ground-glass and see the images passing and repassing so rapidly over its surface. One should first look around for subjects approaching, then quickly get them on the ground glass, keep them in focus as they draw near, and snap the instant they are right. To hesitate is to be lost. Anticipate their advance over the plate just a little, yet not much, for the curtain is released very swiftly, under strong pressure of the lever. Still using the single lens, we may walk toward birds alighted or on their nests and take them

so, or as they fly up. In a colony one needs many plates. I find that I can use as many as sixty in a day, under favorable conditions, and all carefully exposed. The time is golden, and one must not keep the birds off their nests in any one place very long, for, if the sun is hot, it will result in the destruction of all the eggs and young.

Pictures of birds in flight are always of great interest, and one should study every possible means of securing these. Swallows flying to their nests make possible subjects, also chimney swifts entering or leaving a chimney, ospreys near their nests, ducks or herons flushed in a marsh or from the shore, gulls hovering about docks, terns over schools of fish, shore-birds flying along the beach, wild-fowl flying over promontories, and so on. The more one studies to find opportunities, the more will various ways and means be thought out. The artistic possibilities of this sort of work are very great. One or more flying birds in an attractive combination of landscape, shore, or wave may make a wonderfully effective picture.

Even when there are no birds to be photographed, the reflecting camera is a very useful instrument to have. Merely by looking at various scenes through the large view-finder as one walks out, many artistic possibilities may be noticed, which otherwise would pass unrecognized. It is the instrument, above all others, with which to take pictures of children, domestic animals, people in action, sporting or athletic



Bittern on the beach assuming the hiding pose, as though among rushes.
(Telephoto.)



Bittern on nest defying the photographer.

events, and anything of interest where there is movement, though it can also be used on the tripod for timed exposures.

Some may wonder why one might not as well have a reflecting camera only, and use it for all purposes. This can be done, though there are some drawbacks. For one thing, the curtain shutter cannot readily be released by string or thread from a distance. Yet one could obviate this difficulty by adding a lens shutter. It is also heavy to rig up in trees, and inconveniently large to hide by nests, though these obstacles are not insuperable. Often it would be convenient on an excursion to be able to do everything with one camera. Yet on the whole it is better to have beside the reflecting instrument a small, light, ordinary camera, as previously described, weighing only a couple of pounds, using the same lens and plate-holders interchangeably with the other, so that both can be carried conveniently when there is any likelihood that both will be needed. This makes a very effective battery, complete for every possible need.

BIRD-LOVERS' VACATION EXPEDITIONS

CHAPTER XVI

BIRD-LOVERS' VACATION EXPEDITIONS

IN these days the vacation habit has become well-nigh universal. Nearly everyone plans, if it is a possible thing, each year to take a vacation trip away from home. The gunner is off to distant woods, the fisherman to long-desired waters. But a great many people simply make a trip to the country or the sea-shore with nothing very definite in view, to spend much of the time, perhaps, idling on the hotel piazza. This may suit some, but a vacation is far more profitable and enjoyable when based upon some quest which arouses enthusiasm and incites to exercise in the open.

To those who care for birds I commend a vacation trip to explore some new or interesting locality in search of novelties. It may take the form of seeking the haunts of some particular species or classes of birds which have not yet become familiar, in order to add them to one's "repertoire." In conjunction with this the camera may play a very important part, and make it truly a hunting trip, with all the zest of the chase felt by every true sportsman. To make a census of the bird-fauna of a little-known region is another interesting line of work, as is the working

out of a detailed study of some rare or peculiar species.

From such a trip, on which one has lived outdoors with mind and body alert, one will get tenfold more benefit and exhilaration than by dawdling about a fashionable resort. The more tired one is, generally speaking, the more does one need such a trip as I describe. For my own part I know that to feel the way I do when returning from a vacation of this sort is worth more than gold — to renew one's youth, with all its freshness, vigor, vivacity, when nothing is too hard to undertake and life is abundantly worth living. In contrast the air indoors seems dead, and one wants to throw everything wide open and welcome the atmosphere of the woods, shore, or prairie.

Of expeditions of this description there are many sorts, suited to one's means or inclination. If the expense must be moderate, it will cost less to put up at the home of some farmer or fisherman in a locality rich with birds than to board at some much-advertised hotel and will probably afford better opportunities for success. If one can find suitable companions, it is perfectly possible to try the tent and camp outfit, which is often the very best thing to do in a sparsely settled country, so that one can be right in the haunts of the birds without loss of time.

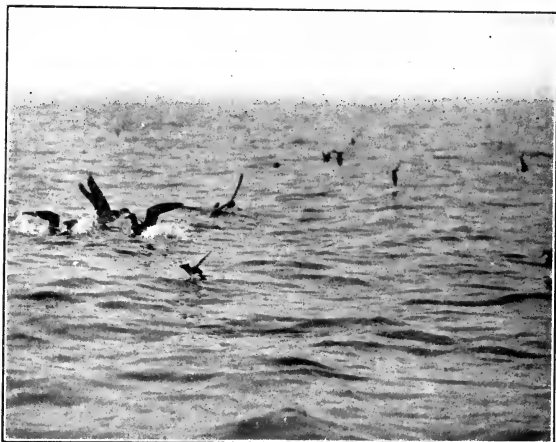
Usually the most interesting time for an expedition to study birds is in the nesting-season, so it is in regard to this period that I will first make suggestions. Of course the easiest plan, which the greater number

will probably adopt, especially if living in cities, is to choose a favorable locality in some bird-country not far away, and spend the vacation period there, or perhaps divide the time between two places of somewhat dissimilar fauna. It takes considerable time, however, to become familiar enough with one region to secure good results, so it is generally best not to move around too much, unless a locality should prove really unsuited to the purpose.

The exact time of the trip will depend upon what sort of birds one wishes to find nesting. Early June is ordinarily the best time in the northern half of the United States and southern Canada; the middle of June for localities far north, such as the Magdalen Islands, Newfoundland, and Labrador; and May, for the Southern States, exact dates varying according to latitude. Early June is the time to be on the ground in the wildfowl resorts of Minnesota, North Dakota, Manitoba, and Saskatchewan. At these times the bulk of the birds are breeding. But if one wishes to look up special things such as the nesting of the raptorial birds, it will be necessary to make an earlier trip especially for them. About the middle of May is a good time for the smaller hawks and middle of April for the large hawks and all the owls except the great horned, the average time for the latter being early March, though the young will be in the nest till early or middle May. In the Northwest the middle of May is a good time for hawks and owls.

As there are interesting localities for birds the continent over, many of which I myself have not visited, the best I can do is to suggest a few localities of special interest. Less is known about the nesting habits of the migratory birds which go north of the United States than of most others, so there is a fascination in following them to the north. Many of the warblers, thrushes, and others, nest from the latitude of northern Maine on, and researches among northern conifers and bogs are rewarding. The Maritime Provinces of Canada are very interesting ground. Every bird-lover may well long to visit the famous Bird Rocks of the Gulf of St. Lawrence, which is as thrilling and spectacular a trip as there is. Ambitious bird-students may bear in mind that the breeding-habits of most species which nest in the far north are very little known, and the greatest prizes are there awaiting someone. The great difficulty is that ice usually prevents access till the nesting is over, making it necessary to endure the Arctic winter in order to be on hand in time. But just imagine the delight of finding the nests of such birds as the golden plover in the Arctic moss back from the shores of the polar sea!

A tour among the prairie lakes of the interior Northwest, from North Dakota northward, is one of great delight. A team and buckboard, tent and camp outfit are the proper equipment for making this to good advantage. The distances are so great as to make this imperative to get to the water-bird colo-



Greater Shearwater and Wilson's Petrels, off Cape Cod,
attracted by throwing out liver.

—pp. 163-4



Turnstones and Sandpipers on sandy beach.

—p. 165

nies and other wild, interesting localities. The various protected colonies along the Atlantic coast are very fascinating. To visit them, one should secure permission from the National Association of Audubon Societies, and go with the wardens, who know how much intrusion the birds can stand. If many strangers should undertake to visit them freely, the eggs would be spoiled, and it might become necessary to keep everyone off.

On the coast of Maine about the middle of June finds all the birds with eggs, and middle July is a good time to see the young. Late in that month some are awing. On the southern coast the sea-birds nest remarkably late, and not all the eggs are laid till the middle of June. Visits to Florida inland rookeries are best made from April to early May. The shore-bird migration on the southern coast in April and May is of great interest.

A few trips at other times of the year may be suggested. Visits in mid-summer to the haunts of the off-shore ocean wanderers are fascinating, as off Chatham, Massachusetts, or Cape Sable Island, Nova Scotia. These and other outlying points on the coast are as good places as there are on the north Atlantic coast to find shore-birds. The latter part of August is perhaps the likeliest time, but the growing scarcity of these species is a disappointing and lamentable fact. Persecution has led many of them to migrate past us out to sea. The spring migration, on the southern coast, when the birds, in full

plumage, linger to feed after crossing the Gulf, affords the best opportunity to know them. A vacation by the sea or inland waters in October when the wild ducks are migrating is a delightful experience. To watch the sea ducks in rapidly following squadrons flying south off the ocean beach before and during an easterly blow is thrilling and wonderful. Opportunities can be found for photographing these migrants.

When it comes to winter trips, the best opportunities are found south. Wild-fowl in immense numbers resort to the shallow bays from Virginia southward. In Louisiana and Texas are wonderful resorts for ducks. Florida is pretty much "shot out" along traveled routes, but there is some interesting bird-life in the more remote parts. Mexico is a treasure-house of winter bird-life. The same is true of localities on the Pacific coast, but of these I cannot speak from experience.

In planning these trips, especially those to distant or inaccessible localities, it is necessary to begin a number of months in advance. Communication is very slow, owing to infrequent mails and the reluctance of many local correspondents to submit to the ordeal of writing. Often it takes months before they can be induced to reply. All details should be arranged in advance, and even then important matters may fall through, as when the owner of a vessel failed to keep his agreement and we were compelled to risk a visit to Bird Rock in an open boat.

I shall not attempt any suggestions about general outfitting and camping, but will refer the reader to Mr. Kephart's book on these topics. All the suggestions I shall offer are a few on the photographic outfit and its transportation. On any extended trip, the two cameras and all the apparatus previously described should be taken. Stuff paper into the cameras, and pack them in the trunk or chest with clothing around them. The stock of plates should be large enough for anticipated needs. For a month's trip I usually carry four or five hundred. These are heavy, there is no denying. Sometimes on the return I send the exposed plates home by express. Ordinarily, however, I have found that when packed in trunk or chest, it is next to impossible to break them. When the exposed plates are taken from the holders, they should be packed in the original boxes level full, no more, each pair of plates with the film sides together. It is not necessary to trouble with the original separating strips, which are more to keep them from sticking together if damp or wet.

Great care must be taken to keep plates and apparatus dry. A soaking is well-nigh fatal to a camera, or to plates, especially if they are packed in close contact. The exposed plates I pack thus for convenience, but keep them very carefully in my personal baggage. Most if not all plate-manufacturers now pack the plates with the coated surfaces separated, and I would not use any put up otherwise.

On one occasion in my experience had they not

been so packed, I should have lost half my stock where they could not be replaced. It was on an expedition among the Florida keys. The heavy boxes of plates were stored in the hold of our vessel, and one night the craft sprang a-leak. In the morning the crates were half submerged. By putting the individual dozen-plate boxes on the deck in the breeze, they finally dried out, and only the rims were spoiled, where the strips stuck to them. Had the faces been in contact, they would all have been welded together.

The problem of changing plates is rather a troublesome one afield, where there is no dark-room. Ordinarily one must wait till night, yet sometimes when all the plates in the holders have been exposed, one may need a few more at once very badly. A "changing-bag" will serve to transfer a few in an emergency. Where I have been without one and needed plates very much, I have managed to change a few successfully under heavy blankets, or in a small closet on a vessel under a canopy, with all cracks stopped up. Ordinarily, however, one must wait until dark, which in northern latitudes is not before 10 P. M. Sometimes I have had to do it in the open, as when exploring the great mangrove swamps of southern Florida without a tent, where the mosquitoes were after me in such swarms that I could not help mashing some of them between the plates as I packed them.

When there is bright moonlight I change plates under a blanket. Perhaps moonlight would not fog



Home scene in rookery of Black-Crowned Night Herons. Their easy pose shows how perfectly tent conceals photographer.

—pp. 197-8



View in Great Blue Heron colony. Taken from tent, by single member of doublet lens.

—pp. 196-7



them, but I never take chances with valuable plates. When in a tent or the cabin of a small vessel I wait till all lights are out and then work for an hour or two. This sort of thing, when kept up for a month, especially when one arises at dawn, is certainly arduous. After such a tour in Saskatchewan, I slept nearly all the way on the three days' journey home. The experience, none the less, was most invigorating, and I had hundreds of fine plates to the good.

It is well to learn to change plates in the dark, without a ruby light, by feeling. There come times when it is a great convenience to be able to do this, and it is not as hard as it seems. Before extinguishing the light, lay everything out in order. On one side put the empty boxes to receive the plates, previously labelled and dated, so that there will be no possibility of confusion, and on the other the boxes of fresh plates, with the edges cut. The holders are piled directly in front. As you take off the slides, lay them and the holders down each in the same way. After safely packing all the exposed plates, the lamp may be lighted and the ends of the slides inserted in the holders, these being piled up, ready for the insertion of the new plates when the light is again put out.

On returning home it is no small task to develop several hundred plates, but this can be expedited considerably. Some like "tank-development," that is, mixing a whole wash-tray of very weak developer and inserting a considerable number of plates at once.

I prefer, however, to give each plate individual attention. To this end I use two 8x10 trays, each of which will hold four 4x5 plates, or two 5x7, and keep both going at once. I have a tank of fixing-bath, and keep the work up for hours at a time, using metol-hydro developer, fresh and at maximum strength for all rapid exposures, and a batch that is old and discolored for the plates with timed exposures. Should one of these by mistake get into the strong developer, and the image quickly appear, take it out immediately, rinse it thoroughly, and put it in the other solution. Even then it may blacken badly, but keep it in till it is developed clear through, and, if it is too dense, reduce it by the red prussiate of potash and hypo reducer.

On an expedition to any remote and interesting locality it is a great mistake to be too economical in the taking of pictures. Do not "snapshot" everything at random, but make every exposure carefully and with a purpose. Any good bird-subject needs not one but several plates. Some should be duplicates, to make sure of at least one good picture, but also have represented as great a variety of poses of the bird as possible. This is notably true regarding flight pictures. Hardly any two of these are alike, and often I have wished with all my heart that I had taken more, after it was too late. Do not confine the pictures to birds, even though the expedition be one for ornithology, but take also a series to repre-

sent the region and everything about it which is distinctive. There are all sorts of uses for such material, and one's vision and opportunity to make use of it will expand as time goes on.

BIRD-WORK FOR INDOORS

CHAPTER XVII

BIRD-WORK FOR INDOORS

DURING the off-season the devotee of the rod and reel is generally supposed to find diversion in overhauling his apparatus and counting the days until he can use it again. Likewise the sportsman with the gun is lovingly wiping his beloved instrument and fingering the triggers, while memory and imagination run riot. The student of birds is never reduced to such dire extremity, not while health and vigor continue. Yet, though the activities of the field are extended throughout the year, a very real part of the work, fortunately, is for the indoors which permits of the continuance of the recreation during evenings, and especially in the inclement periods when home is the most attractive spot on earth. For such times there are a number of lines of employment and research in reference to birds which are extremely fascinating.

First, one naturally thinks of the literature of the subject, which is now abundant, diversified, rich in interest and excellence, and further brightened by admirable illustration. To give a catalogue and description of all the books on birds would almost require a hand-book of bibliography. One may secure

abundant information at the public libraries, the larger bookstores, and from publishers. Yet some general lines of reading may be suggested.

One of these is concerned with further information as to various birds which we have tried in vain to find. It may be that we have been delighted to find some uncommon nest, and we have a great curiosity to learn how other observers have fared, how their experience corresponds with ours. If it be that we have had poor success in finding certain nests, or have come into a region where there are unfamiliar species, I know from my own experience that it is most fascinating to read everything that can possibly be found upon the subject. In this connection, such a book as Chapman's "Warbler Book" is a model for facts about some species, being a mass of detailed information from various observers in different localities as to their own experiences with that bird. Major Bendire began this line of writing in his two initial volumes on the "Life Histories of North American Birds," which splendid series, unfortunately, was stopped by his death, but which we fervently hope may somehow be continued.

Another line of reading might be called the inspirational type in which are retailed the experiences of the author with the birds afield and his thoughts and descriptions of them in their life-setting. This may be very artistically and charmingly done, from a literary standpoint, as in the writings of Frank Bolles. The hunting of birds with the camera instead of the

gun is opening up a distinctly new literature, with broad possibilities. The economic side of ornithology is becoming a most vital question, and it is both interesting and useful to inform oneself upon the subject. Such a book, among others, is that of Mr. E. H. Forbush, "Useful Birds and Their Protection," which is not only admirable, but interesting as well. If once we get started along some of these lines, in connection with practical experience afield, it will open up a life-long pleasure. For structural and scientific aspects, treated in a popular way, I would suggest C. Wm. Beebe's book,—*"The Bird,"*—which is a mine of general information.

Another line of recreative effort has to do with the recording and making permanent what we have ourselves experienced. The writing of the narrative journal has been referred to. While it is well to do this as soon as possible after the events have transpired, if careful jottings have been made it can be left till the rush of the busy season afield is over, when it becomes delightful to live over again the happy times.

The writing need not be for oneself alone. Indeed, if one has observed unusual or interesting episodes of bird-life—and what active field-worker does not?—such things ought to be shared with the public. The ornithological publications want these things, and so do some of the special outdoor periodicals. Many newspapers are glad to use items of this sort. There may be little if any money in it,

yet it is well worth while, if only for the sake of the pleasant acquaintances and associations which it secures. The general literary field is a harder one to enter, yet from the ranks of the amateur contributor the nature-writers of the future are to come. Much possible inspiring literature may be lost if the new generation of lovers of the birds hide their light under the bushel or bury their talent in the earth.

The bird-lover who uses the camera has a wide realm of fascinating winter or evening employment opened up. First, and possibly more prosaic, yet interesting to the collector, those negatives, the trophies of the chase, must be cared for. Manila envelopes or "negative preservers," of the right size, should be secured from the photo dealer, and each negative placed in an envelope, labeled, and catalogued. If the series ever gets as large as mine — which now numbers some five thousand, and is rapidly growing — this will take a good many evenings.

In various cases the image of the bird needs to be enlarged, to make the best possible picture. If it be perfectly sharp it can be successfully thrown up from two to four diameters. For this there are various methods. A single enlargement on bromide or velox paper can be made, but personally I prefer to have an enlarged negative from which I can print at will, on any sort of paper. For this I use the daylight process, simply placing two cameras with long bellows on a board with an upward slant at a window looking out upon a clear, unobstructed sky space.

They are set face to face, with one ordinary photographic lens between them to make the image, and a dark cloth thrown over the junction to keep out extra rays. The ground glass is removed from the front camera and the negative inserted in its place, or set close in front if it be of larger size and only a part of it is needed to enlarge. Then it is simply a matter of adjusting the bellows. For enlarging, the front bellows is short and the rear one long, and vice versa for reductions to make lantern slides. After securing a sharp focus, the plate-holder is inserted in the rear camera and an exposure made by the bulb.

The same rapid plates may be used as afield, if more convenient, but I advise securing a slower grade, which are easier for the inexperienced to handle. With the latter, with the lens wide open, a usual interval for exposure with a normal good, rather plucky negative, would be about two seconds against a bright sky, and more according to the light. Over-exposure will make a flat, gray picture, not as good as the original.

This process secures a positive. After that is developed, fixed, and dried, some evening a contact negative must be printed from it. Simply put the positive in a printing frame, film side up, and lay a plate upon it, the sensitized sides in contact. Expose this to a white light, a foot away, for a short interval and develop. The time must be found by test, according to the light used. One or two seconds is usually enough one foot from an ordinary kerosene lamp or

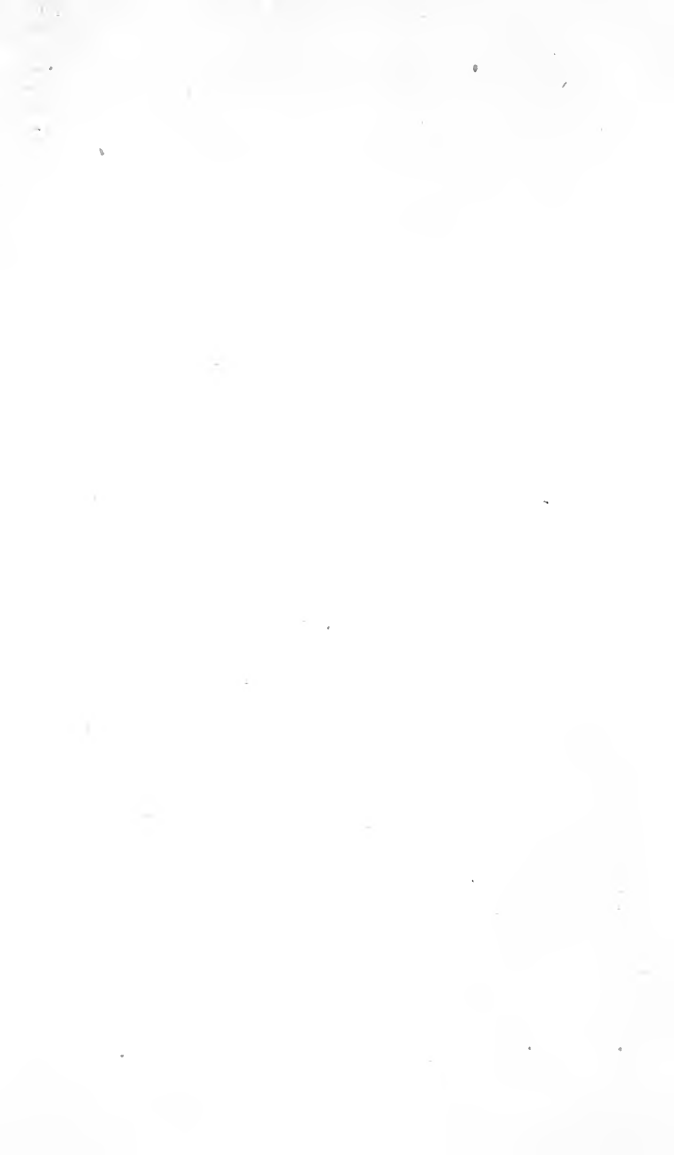
gaslight turned down quite low. A few plates spoiled in a good test will be well expended, and the result should be written down for future use. If rightly timed and properly developed in each case, the enlarged print should appear just as strong and bright as the original, and even more so, if desired.

If the original was weak or flat, the final result can be greatly improved by such a process, either with or without enlargement. Should it need strengthening only to a slight degree, simply develop both the new positive and negative for contrast, being careful not to over-expose, and to carry the development to the full. If the original is decidedly weak, make the best possible print from it on contrastive glossy velox, or similar paper, and then photograph the print, being careful to choose a light that will not show up the grain of the paper, preferably one coming from both sides, by the use of a mirror. Develop this for contrast, and the result may give a pleasant surprise — the dead restored to life.

The above suggestion was only for the enlargement of a part of a negative, to a 4x5 size. But to make larger negatives, as I do, from which to print pictures for framing — 8x10 or 11x14 — if one is ingenious with tools it is not hard to improvise a rude rear camera, merely a light-tight box, one section to slide inside the other, instead of having bellows, and a place for the large holder at the rear. The holder can be either bought or made, as, for that matter, can



Young Cooper's Hawk, just out of nest.



the camera. To avoid the expense of two large plates for each picture, make the positive by contact, and enlarge for the negative. This can be done also when a 5x7 is to be made from a 4x5.

By all means try lantern-slides. It is a very pretty process, and may be made a very pleasant social feature. Buy the regular lantern-slide plates, of the uniform American size, $3\frac{1}{4}$ inches by 4. To use them in the larger-sized plate-holder, either buy or make a frame or "kit" which will hold them in place, and mark off on the ground-glass in pencil the exact range that it will occupy when in position to be exposed. Then proceed exactly as above described, either reducing the size if the whole picture is wanted, enlarging if the image of the bird is too small, or, as it is easier if the size be right, printing by contact in the dark-room. Metol-hydro, of moderate strength, makes a good developer, though hydroquinone by itself is safer for beginners, if the temperature of the room can be kept about 65 to 70 degrees. Brilliancy and detail are desirable in lantern-slides, and the skies usually should be clear glass. If the slide is overexposed and blackens, do not hurry it out of the developer, but leave it till the image is very strong through the back, no matter how black it gets. After fixing and before washing, clear it to the right degree with the red prussiate before mentioned. This can also be used locally to wipe out all fog from the sky by simply applying it with a swab of absorbent cotton, not allowing it to run on the

wrong place, and having water for rinsing ready for instant use.

It is easy to learn to color lantern-slides successfully, which adds much to their popular effectiveness if reasonably well done. I recommend the so-called Japanese transparent water-colors which come in booklet form, with the coloring matter deposited on the pages, tiny pieces being snipped off and put into water. It is very fascinating work and not difficult. Buy with the colors a booklet about coloring lantern-slides and try it. One can also in the same way utilize the positives made in enlarging for transparencies, to be hung before lamp or window, colored if one wishes, and bound with a plain glass over the film in front to protect it and a ground glass behind to show off the picture better, unless it is to be in front of a lamp shade, when the latter will not usually be necessary, and perhaps not any way.

For prints to be colored, a paper with a non-glossy matte surface should be used. Matte velox or similar paper is good, but platinum, though expensive, is the best and most durable. Platinum requires a plucky or brilliant negative as for solio, and velox a soft negative, with good detail but not too strong contrasts. If the negative is intended for velox, the development of the plate should be stopped sooner than otherwise. For coloring prints the ordinary best water-colors should be used, and not the transparent lantern-slide colors, which presumably are all aniline, and would probably tend to fade if kept in

the light. If the lantern-slides are kept in boxes or drawers, they will not fade perceptibly for a long time.

It is well to have albums of prints of all pictures thought worth saving and keep them up to date by printing, each winter at least, the series of the previous season. Should anything happen to the negatives, as by a fire, the prints could be copied, and one would not lose the whole accumulation of years. Should a valuable negative be lost or broken, it could then be replaced. In the case of specially valued pictures, it is very gratifying to have them framed on the walls, enlarged or colored if desired.

From the above hints it can be seen what a delightful program of fascinating indoor work may be enjoyed by the bird-enthusiast. This will do much to make the periods of disagreeable weather thoroughly enjoyable and keep the mind that has the instincts of the naturalist satisfied and content till the spring returns, the birds sing, and again we can be much of the time outdoors.



SOCIAL BIRD-STUDY

CHAPTER XVIII

SOCIAL BIRD-STUDY

“**T**WO are better than one” is a truth that has wide application. Though it is perfectly possible to enjoy the birds alone, the pleasure of the study is greatly enhanced by knowing others with whom to share it. There is something so fascinating, so enlivening, about outdoor study of birds, that those who acquire the taste for it fall into a sort of natural fraternity. People who know the birds are acquainted the moment they meet.

There are times, of course, when it is not at all necessary, or even desirable, to have human company afield. In photographing birds, save in some special cases where assistance is needed, the fewer people there are around the better. If one is active and agile and really wants to “find things,” it is a hindrance to have someone along for whom it is necessary to be constantly waiting. In cases requiring careful, patient observation, company may prevent one from taking time for the best work. The birds themselves are very good company.

All the same, however, it adds greatly to the zest of the thing to be working, through various chan-

nels, with fellow enthusiasts. On many, if not most, occasions afield the presence and coöperation of an alert and enthusiastic person are pleasant and desirable. Conversation will help the time pass when birds are not in evidence. If the one is especially keen of hearing and has a good ear for songs, and the other excels in quickness of sight, two will surely find more birds than can one alone. And, though they should be evenly matched, two can cover more ground than one, flush more birds, beat out more nests, surround a tree or thicket where birds are hiding.

If on the water, two can row a boat farther and faster than one. If one is to climb a tall tree to a hawk's nest in lonely woods, it is little short of folly to do it alone, and it steadies the nerves and helps to prevent accident simply to know that someone is on hand. All in all, it is very pleasant to have congenial company when afield.

Even though varying hours of business or duty may rob us of desired company for a walk, we can well afford to be out alone often if there are fellow workers with whom we can share experiences. "Swapping yarns" is a custom which will be popular as long as the human race shall last. The search for birds is a productive source of discovery and incident, eminently fitting in with social purposes, and, through comparing experiences, each will learn much and receive a great deal of pleasure.

In case one is just beginning to study birds, it is a good plan to try to induce a few others to begin



Pet Sparrow Hawk, eating dinner.



Louisiana Heron at nest. Very timid. Photographed from tent.



at the same time. When one has already acquired some experience and needs company, it will be quite worth while to give others the benefit of the experience gained and try to lead them along. If one will take a little pains to interest boys and go afield with them, there will probably be little trouble in starting a crop of enthusiasts, and it is surprising how fast an active boy will "catch up."

An excellent step to take, when there are a number of bird-lovers in a community, is to organize a bird-club or start a branch of the Audubon Society. The latter aims not only to protect the birds, but to encourage acquaintance with them as well. Whatever the organization, it had better be as informal as possible, with no burdensome dues or elaborate rules. It may be simply an agreement to get together now and then to "compare notes." If the members take notes, they will have something to compare. Different ones will have found different things of special interest, outside the experience of the rest, and it will be a mutual pleasure to give and receive new information, or to compare photographs or lantern slides of bird-subjects.

Every such group of students should select some definite district of the surrounding country for investigation and for working up a list of its bird-fauna,—and this applies just as much to an individual working alone as to a group. The town or city can be made the district. A county list is a more ambitious undertaking. To do this well, it is

desirable to secure coöperation from observers over the county as widely as possible. Even if a county list has been published, it can be made an object to increase or revise it.

No matter who else are working, each person should keep his or her own individual bird-lists. These may be the local list of the birds seen in a defined locality, the "annual list" of the birds observed during the year, and the "life list" of birds personally seen and identified by the observer. Comparing one's own lists with those of others will be found a great source of pleasure. It goes without saying that without a strict sense of honor on the part of each friendly competitor, such work is impossible.

A plan which could be carried out by a club or group, and which might well prove stimulating and amusing, is to hold a series of "hunts for points." Those concerned might agree upon a scale of values for each species liable to be found in the region, giving each one a number representing its supposed desirability and degree of rarity. One could be the unit of value of the most common birds,—such as the robin, chipping sparrow, and others; two for birds moderately common, as the chestnut-sided warbler, vesper sparrow, etc; three for species less common, such as the scarlet tanager, rose-breasted grosbeak, etc.; four for irregularly distributed species, or those hard to see, like the grasshopper sparrow, white-eyed vireo, rails, etc.; five for those rather rare,

such as the Tennessee and Cape May warblers, yellow-bellied and olive-sided flycatchers, etc.; and from ten upwards for others of still greater rarity.

The scale of values, of course, should be different for the several seasons. Many birds common in summer would be the greatest rarities in winter. To get up such a scale of values is considerable work and needs some expert advice. Still, no one would be harmed if it did not entirely represent true values, and, if agreed upon, the members could have some exciting hunts. Such a pastime is infinitely ahead of the brutal one of shooting for a maximum record; it would be a hunt for points, comparable to army maneuvers in mimic warfare.

On a given day each one in the game would put in the specified hours afield, make a list of species identified, and score accordingly. As more people come to know the birds, I see no reason why such hunts should not become more popular. No birds would be hurt, and all concerned would get some glorious exercise and have a splendid time. An evening could be devoted to the judging of lists, hearing stories of the hunt, and awarding prizes. A simpler form of competition would be on the basis of the largest number of species seen, the rarest or most difficult bird to find, and so on.

The interest attaching to the making of a list of birds personally identified is much greater than one would at first imagine. Especially when the list has grown to goodly proportions, the desire to add to

it, or to surpass someone else, will set one to reading the bird-books eagerly to see how or where to find this or that bird, and send one off on all sorts of adventurous trips, to explore some mountain, forest tract, bog, or what not, and there will be a fine spice of zest served with the simple lunch afield. Though I am blessed with a normally healthy appetite, I can truthfully say that I would not hesitate for a moment between the best banquet that any caterer could serve and a package in the pocket containing two sandwiches and a slice of cake or a few cookies to be eaten on a bird-hunt with some quest in view which inspired my enthusiasm. I would choose the latter without a moment's delay.

Any bird-lover can have the privilege of alliance with the fraternity of those like-minded, not only in one's own locality, but in very broad relations. Every bird-lover in America would be welcomed in the two great representative organizations, "The American Ornithologists' Union" and "The Audubon Society," and be stimulated by acquaintance, either personally at meetings, by correspondence, or through the published organs of these societies, with the most active and successful workers. The beginner should certainly subscribe for *Bird-Lore*, the popular organ of the Audubon Society, and, if the interest in birds does not abate, for *The Auk*, which is the leading scientific publication of America. The latter is not unduly technical in character, but it gives the latest discoveries and researches in ornithology and is ab-

olutely essential to one who takes any serious interest in the study. It is published by "The American Ornithologists' Union" and is sent without further charge to members. Inquiries should be addressed to the office of the National Association of Audubon Societies, 141 Broadway, New York City, and to the treasurer of the American Ornithologists' Union at 134 West 71st Street, of the same city.

These magazines furnish a bond of union between bird-lovers all over the country, and the editors are glad to hear from all who have items of interest about birds. No one who intelligently tries to know the birds is working alone, and all can feel that though they may live in the remotest spots, they can easily, if they will, be in touch with kindred spirits everywhere.



BIRD-STUDY FOR SCHOOLS



CHAPTER XIX

BIRD-STUDY FOR SCHOOLS

IN securing the introduction of musical study into the public schools of a New England country town, I had occasion to consult the opinion of a prosperous farmer who was considered to be among the more intelligent men of the community. His answer, as nearly as I can quote it, was as follows: "The young ones in our schools can't half of them read so you can understand them. I say, before we teach them anything more, they had better learn how to read!"

This attitude, once common, especially in rural communities, is now, fortunately, buried largely under the advance of more liberal views. The tendency is rather in the opposite direction, to interest the young in many departments of knowledge, so that they will want to read. Sometimes the curriculum may be overcrowded, and this extreme, of course, must be avoided. The need is to find a proper balance and, for one thing, not to so magnify any one aspect of education as to crowd out things which have an important bearing upon life's main human interests.

A great many people to-day are beginning to ask

whether mental training must be confined largely to matters which few people care permanently about and which after graduation are promptly forgotten. Is there not as much intellectual stimulus in things with a human interest, which really enter into the natural furnishing of human life? People observe that prices of staple goods are constantly soaring, that agriculture is handicapped for want of men, and yet that hosts of graduates, whether from city or country, are overcrowding the professions and sedentary employments. There is more than a suspicion that our past system of education somehow spoils many people for their surroundings and fails to develop them along the lines of their natural and proper interests. If some say that only antiquities and philosophies give properly sharpened intellects, it may be an open question whether we are not overstocked with that particular brand of intellect. The fact is that we have been training all children alike for city life, giving country children a prejudice against the country. So we pay the penalty.

Nature is so varied and wonderful that it would be strange if there could be found no proper mental training in knowing her many aspects and understanding her marvelous ways. This is an age of science, and the comforts and advantages of our modern civilization have come largely through studies of nature, learning how to utilize her processes. It is manifestly unfair to our children to equip them with a purely scholastic outfit and leave them really

unequipped for their environment in a material world. I believe that we are now on the borders of a tremendous upheaval in education. Within a few years children will be allowed to understand better the world in which they live. Even the city child needs to know the natural world, as a source of immense benefit and delight. In the country schools emphasis will certainly be laid upon the various phases of nature.

One general phase of the new education will be to train the faculty of observation by teaching and encouraging the young to investigate, to see things for themselves, and to draw their own conclusions. The training of the faculty of observation is one of the great avenues to business success, which in these days comes through original observation in seeing opportunities or possibilities, and working them out. This element is important in every calling, whether it be a "profession," agriculture, manufacture, or commerce. And surely there is just as effective a means of training the mind through science as by Latin classics, useful as is the latter method. Every child alive ought to have some training in nature-study. Not only will it be a means of mental stimulus, but a moral good in occupying attention with things that are wholesome and worth while and a physical benefit in imparting interest in outdoor things to entice the young into the open.

As a matter of fact, such work in the schools is being quite generally begun. Many cities and towns

are at the present time introducing it. Without doubt it will soon become universal, and to the next generation it will seem amazing that children were ever allowed to grow up ignorant of the world in which they live. How far the movement has at present gone can be suggested by the response to a circular letter recently sent out, for another purpose, to supervising principals by Mr. E. C. Stiles, supervisor of schools, West Haven, Connecticut. Out of twenty-three answers at present available, thirteen reported nature-study in the curriculum, and of these eleven included bird-study in that course. These schools were of the better class.

Along this line, as a sign of the times showing that the public are beginning to realize the necessity of conserving the great national asset of bird-life in order to save our harvests and trees from insect pests, it is interesting to note that at the last session of the legislature of Illinois a bill was passed making it mandatory that every teacher shall give at least half an hour each week to instruction in kindness to animals and in *bird study*. It is also provided that in case of failure to do this there shall be a forfeit of part of the salary. It certainly looks as though the coming generations in that State would have intelligent ideas as to the value of bird-life, and we are not rash in believing that the same thing will be true of other States than Illinois, through similar methods.

This movement is so new that it is still in the formative and tentative stage, and no one approved and



Flicker near low nest-hole by road. Camera set on fence.
—p. 105



Industrious Downy Woodpecker at work.



authorized system or grading in teaching nature-study has yet become recognized and adopted. Supervisors and teachers are as yet thrown considerably upon their own resources. There are no particular books which are required to be used. Yet there is one main principle upon which there is general agreement, that just as far as possible this line of study is to be drawn from nature itself, rather than from books. Books may be used as aids, yet unless the pupil can be induced to get acquainted with the bird, flower, or whatever it may be, outdoors in its natural surroundings, or be inspired and interested through the indoor study to seek them out, the main good of the course is lost. One teacher told me that she would rather have a pupil know one bird in wild life than ten from pictures or descriptions. The arousing of intelligent interest in the outdoor world is the supreme purpose of this work, not the cramming of the child with a mass of facts for class-room recitation.

All this is distinctly encouraging for the average teacher. To teach bird-study, for instance, one need not be a trained ornithologist. That would be unreasonable to expect. But any teacher can have an interest in the great outdoors, and have or gain an ordinary knowledge of some of the more familiar birds, animals, flowers, trees, and processes, and inspire the children to become familiar with them. About the birds, for instance, teacher and pupils may frankly learn together. Wise teachers, who read the

signs of the times, are fitting themselves along this line. Some are attending summer schools with this in view. This line of work is now taken up in most, if not all, normal training schools, and it must henceforth be considered a necessary part of the training of a well-equipped teacher to know the rudiments of the natural sciences, with a view to being able to teach, or lead, in this inspirational way.

It is no excuse for not teaching the children anything about the natural world that the curriculum is already overcrowded. If that is true, so much the worse for the curriculum. It is clearly wrong if the young must learn only books and little or nothing of their surroundings in the world. This must be set right, even if the whole theory and plan of education has to be changed, from kindergarten to university. Indeed there is a growing conviction among educators that more about nature must be taught in the grammar grades and certain other things be postponed or omitted.

The time to begin is not in the high school, but with young children, before their tastes and habits are formed. Some teachers even begin in the first grade. And why not, since by nature every little child is passionately fond of the animals and birds?

This is also suggestive as to where to begin; of course, with the common local wild birds and animals, especially the birds, because the wild mammalia are mostly scarce or nocturnal, whereas the birds are the forms most easily observed. In my own school

experience as a pupil, we began with infusoria and the lower forms of life and worked up toward higher orders. This only came in the high school and from books. This was the wrong order, at the wrong time, in the wrong way.

Some of the larger schools already have teachers of nature-study, or natural science, giving pupils the benefit of trained enthusiasts, which is an excellent plan. In many other cases it will prove feasible to have supervisors of nature-study for groups of schools, as they do for music or art work. But in the smaller schools, and in country towns, for years to come the dependence must be upon the average teacher.

The course in nature study, beginning with birds and animals, usually includes lessons in flowers and trees, and sometimes a little popular geology and astronomy, with chemistry and physics later. I suggest adding to it the common facts of meteorology,—the cause of wind, storm, rain, dew, frost, and so on, things which are matters of daily observation and interest with everyone.

For the guidance of teachers who wish to get some general ideas of how to teach bird-study, I will briefly describe some of the methods now in use. Most teachers use the Audubon Society chart of common birds, and some of the Perry pictures, to show the pupils what the particular birds under discussion are like. These should be used as means to help them to recognize the birds when they see them outdoors.

The usual method is to select certain species of birds which are common in the locality and learn the main facts of their lives, as far as possible from personal observation of the living birds. If they know the bird in life, they are apt to be interested in it, and are glad to supplement their knowledge of their little friend by what they can read or hear. In connection with this study of specific kinds of birds, teachers also impart general information as to such matters as food, travels, nesting, structure, classification, and so on, according to the grade of the pupils, and in a style adapted to their age.

Whenever it is possible, the teacher should show children the birds outdoors. This is often impossible, yet in the country birds can frequently be found right around the schoolhouse. I was once visiting a school close by which there were blossoming apple-trees, which were fairly alive with migrant warblers and other resident birds, and I was able to point out to the children quite a number of kinds right from the window. The teacher should try to know at least the more common birds from life. A school superintendent, in visiting a certain school, heard the teacher give a lesson on the house wren. She was doing it from a book, while all the time a wren was singing lustily close by an open window. The teacher, in reply to a question by the supervisor, who knew the bird, replied that she had never seen a wren and had never heard its song!

Miss Abby P. Churchill, instructor in natural

science in the State Normal School, Fitchburg, Massachusetts, has sent me an outline of her very excellent course in bird-study, which I quote in part. She says:

"I try in the first grade — or in any grade, if the children are beginners in bird-lore — to have them realize what wonderful little creatures birds are. They never tire of talking about what birds do, what they eat, how they build their nests, etc. The 'First Book of Birds' and 'Bird World' have good material for this purpose. Some of the headings are: Bird Cradles, Baby Birds, How Birds Change Their Clothes, What Birds Eat, A Bird's Education, What Birds Do in Rainy Weather, A Bird's Travels, How Birds Work for Us, How We Can Help the Birds.

"I try to have each child in a certain grade become acquainted with a specified number of birds, increasing the number in successive grades. I tried at first assigning certain species, but found it impracticable for the reason that some species would be so rare some years.

"In teaching individual birds, I think the first impressions ought to be obtained from the bird itself. With normal students, however, I find that descriptions beforehand are helpful.

"After the children have been for a walk, I have them find the pictures of the birds they have seen and post them on the bulletin board. They thus serve as reminders while we are talking about the

birds. I sometimes make a list of arrivals after the manner of a hotel register. For example: 'The Bluebird registered in Fitchburg this morning. How long will he stay?' 'The White-throated Sparrow has registered for a short stay. He is on his way to his summer home.'

"I find that children are more interested in a bird's disposition and in his character than in his personal appearance. It was for that reason that I made my collection of quotations. [Miss Churchill has compiled a neat volume of 186 pages with a title which adequately describes it,—'Birds in Literature.'] I like to speak of them as testimonials that have been written by people competent to judge. Children always like legends, and certain of the poems they enjoy very much, but they like best of all the characterization of the songs by words.

"In the sixth year we group the birds according to color. In the seventh grade, as the birds arrive, we place them in guilds, using the classification used by Mabel Osgood Wright in her 'Citizen Bird,' namely: 'Ground Gleaners, Tree Trappers, Seed Sowers, Sky Sweepers, Wise Watchers, Cannibal Birds.' In our highest grammar grade we correlate bird study with forestry, taking it under the heading 'Friends of Trees.' The Davis Press of Worcester, Massachusetts, publishes a set of outline drawings of birds that are good for coloring. *Bird-Lore* also has good ones, but any teacher can make hectograph copies."

These practical suggestions by Miss Churchill are admirable, and should be widely utilized.

Pending a formal placing of the study of birds, as a branch of nature-study, in the regular curriculum, the subject is often studied without studying. In many a schoolroom the Audubon Society colored chart of common birds hangs upon the wall, and most of the children recognize every one of these species which is numerous in their vicinity. Some teachers encourage independent research by having a school or class "bird-list," consisting of the names of species of birds identified by the children, posted on the wall. Whoever first reports a bird has the coveted honor of having the discoverer's own name follow the name of the bird on the list. This often arouses great interest and sets bright eyes scouring the outdoors. Some birds are to be found in the average city, notably in large parks, and more in the suburbs, but it needs a teacher who knows the birds to conduct a school bird-list.

Some other things which are done, or may be done, are as follows: Interesting nature-books are provided in the school library; stories are read about phases of bird-life or incidents of birds, and the pupils are asked for short essays about them; original investigation can be encouraged by the offer of prizes for the best accounts of observations and discoveries afield relating to bird-habits; one or more illustrated lectures on birds are provided each year in many schools. Another pleasant feature of this move-

ment is that teachers often go afield with their pupils, and by so doing are not only able to guide their observations and show them how to work, but also come into friendly sympathy with them and thus secure far more influence than contact in the school-room would make possible.

This informal study of birds as it is now being conducted is accomplishing another very desirable end in arousing a spirit of kindness and thoughtfulness for the feelings of others. When boys are taught to enjoy and appreciate birds and animals, stoning, tormenting, and nest-robbing are no more. The lessons of conservation and protection are well learned, and presently there will have grown up a strong body of sentiment which will reveal itself in wise laws for the protection of bird and animal life, and in further measures for the conservation of all our national resources. Those who are thoughtful of animals will also tend to respect the feelings and rights of their own kind, so that these studies cannot help but make better men and women.

Only a small amount of time need be devoted to these studies of the natural world, which, as has already been proved by actual test, can be gained through a little economy here and there, without in any way lessening the effectiveness of other branches. Such studies come more as a relaxation than a burden to young minds which naturally delight in outdoor things and are felt to be of inestimable value

in creating an attitude of more vital touch and harmony with the natural surroundings of life and a deeper enjoyment and appreciation of the beautiful things of the world in which we live.

INDEX

- Activity needed, 42.
Albino, 116.
Albums, 237.
American Ornithologists' Union, 246.
Arrivals, March, 78; April, 79; May, 81; July, 116; August, 117;
September, 117; October, 121; Winter, 127; Record, 75.
Audubon Society, 21, 219, 243, 246.
Auk, 137, 164, 165, 209.

Baiting Birds, 164, 199, 208.
Baldpate, 160.
Beginnings, 15; Best time for, 65.
Biological Survey, 21, 76, 78.
Bird Clubs, 243; Hunts for points, 244.
Bird-Lore, 127, 246.
Bittern, American, 156, 158, 195; Least, 156.
Blackbird, 40, 116, 120, 134; Crow, 45, 51, 77, 90, 116; Red-
Winged, 56, 64, 77, 95, 116, 122, 130.
Bluebird, 40, 69, 77, 88, 95, 105, 120, 122, 130.
Bobolink, 54, 64, 71, 116, 120.
Books on birds, 229.
Brant, 164.
Buzzard, 144; Black, 136, 144; Turkey, 136, 144.

Camera: Carrying-case, 173; Concealing, 189; Hunting and
Equipment, 169, 179; Ordinary, 170, 183, 203; Reflecting,
171, 203, 211; Type of, 169, 171.
Canvasback, 195.
Cardinal, 131, 137.
Catbird, 55, 88, 95, 101.
Cedar-bird, see Waxwing.

- Chat, Yellow-breasted, 54, 88, 106.
Chewink, 40, 54, 67, 92, 96, 106.
Chickadee, 26, 92, 96, 129.
Chicken, Mother Carey's, see Petrel.
City birds, 15, 101, 111.
Classes of birds, 25.
Clothing, 33.
Collecting, 16, 96, 169.
Coloring lantern-slides, 236; prints, 236.
Coot, American, 156, 158, 195.
Cormorant, 137, 156, 164; double-crested, 137, 157.
Cowbird, 54, 65, 69, 79, 103.
Creeper, Brown, 40, 122, 131; Black and White, see Warbler.
Crossbill, 132, 135; Red, 131; White-winged, 131.
Crow, 58, 70, 79, 90, 130, 146.
Cuckoo, 39, 56, 189; Black-billed, 56; Yellow-billed, 56.
Curlew, 160; Hudsonian, 162.

Dabchick, see Grebe, Pied-billed.
Departure of birds, 117, 122.
Dove, Ground, 137; Mourning, 69; Dovekis, 137.
Dowitcher, 161.
Duck, 94, 156, 159, 164, 208, 220; Black, see Dusky; Dusky, 93, 136, 156; Eider, 137, 157, 164; Greater Scaup, 164; Harlequin, 137, 165; King Eider, 165; Lesser Scaup, 164; Ruddy, 160; Wood, 93, 156.
Dunlin, see Sandpiper, Red-backed.

Eagle, 144; Bald, 90, 136, 144; Golden, 136, 144.
Enlarging, 232.
Equipment, 28.
Esthetic value of birds, 21.
Exercise, 127, 128.
Exposure, Time of, 186, 190, 205.

Falcon, see Hawk, Pigeon.
Fascination of birds, 18.
Feeding the birds, 129.
Fields, birds in, 54, 120, 131.
Films, 175.

- Finch, 120, 122; Purple, 54, 77, 80, 92, 96, 130.
 Flicker, 52, 79, 92, 105, 120, 130.
 Flocking, 115, 118.
 Flycatcher, 40, 120; Crested, 52; Least, 52.
 Focus-cloth, 175.

 Gallinule, Florida, 156, 158.
 Gannet, 137, 164.
 Garden, Birds of, 50, 53, 117.
 Glasses, Field or opera, 28, 29.
 Golden-eye, American, 164.
 Goldfinch, 39, 53, 130.
 Goosander, 136, 156.
 Goose, 157; Canada, 160.
 Goose-neck holder for camera, 176.
 Goshawk, 135, 143, 151.
 Grackle, 51, 69, 91; Purple, 106; Rusty, 69, 122.
 Grebe, 136, 156, 159, 164; Eared (American) 159, 195; Holboell's, 159, 164; Horned, 156, 159, 164.
 Grosbeak, Evening, 134; Pine, 131; Rose-breasted, 55, 68, 106.
 Grouse, Ruffed, 57, 91, 93, 120, 130.
 Guillemot, 137, 164, 209; Black, 137, 156.
 Gull, 136, 156, 210; Great black-backed, 136; Herring, 136, 156; Laughing, 157.
 Gunning-stand, On the, 160.

 Handbook, 29.
 Hawk, 88, 93, 121, 135, 147, 150; 'American rough-legged, 135, 142; Broad-winged, 143, 146; Cooper's, 136, 143, 146, 151, 193, 207; Duck, 143; Ferruginous rough-leg, 144; Fish, 142, 146, 210; Hen, 142, 151; Marsh, 142, 146; Pigeon, 143; Red-shouldered, 63, 106, 135, 142, 145; Red-tailed, 135, 142, 145, 151; Sharp-shinned, 136, 143, 146, 149, 151; Sparrow, 136, 143, 146; Swainson's, 144.
 Heron, 138, 156, 208, 210; Black-crowned night, 67, 156, 198; Great blue, 156, 158, 196; Green, 156, 158.
 Home birds, 49, 53, 101, 112.
 Hummingbird (Ruby-throated), 39, 51, 59, 88, 96.

- Ibis, 138.
Identifying birds, 25, 39, 45.
Indigo-bird, 54.
Indoor work, 229, 237.
Inquiry afield, 147.
- Jaeger, 163, 208; Long-tailed, 163; Parasitic, 163; Pomarine, 163.
Jay, Blue, 39, 58, 63, 67, 70, 91, 129, 137, 200; Canada, 135;
Florida, 138.
Journal keeping, 32, 231.
Junco, 69, 122, 130, 200.
- Kildeer, 156.
Kingbird, 39, 52, 56.
Kingfisher, 39, 69, 77, 91, 130.
Kinglet, 58, 122, 131; Golden-crowned, 80, 131; Ruby-crowned,
80.
Kite, 144.
Kittiwake, 136, 209.
Knot, 161.
- Lantern-slides, 235; Coloring, 236.
Lark, Horned, 131, 133.
Lens, 171, 173; Anastigmat, 172; Telephoto, 173, 175, 198.
Life-history of birds, 96.
Lists of species, 243, 245.
Localities for birds, 49, 59.
Longspur, Lapland, 131, 133.
Loon, 18, 136, 156, 159, 164; Red-throated, 159, 164.
- Mallard, 160.
Mammals, 19.
Marsh-dwellers, 156.
Martin, Purple, 51.
Meadowlark, 39, 54, 69, 71, 77, 79, 91, 93, 96, 117, 120, 130, 132.
Merganser, 157; Hooded, 156; Red-breasted, 157, 164.
Methods of bird-study, 25, 33.
Migration, Fall, 115, 121; Lanes of, 81; Spring, 75, 87.
Mockingbird, 131, 137.

Murre, 137.

Music, Bird, see Songs.

Negatives, Care of, 232.

Nesting episodes, 101, 112; Season, 87, 101.

Nests, Finding, 88, 92, 94; First, 90; Late, 95; Raptures, 146, 149.

Nighthawk, 39, 58, 88.

Notes, Recording, 29, 43, 45, 66.

Nuthatch, 40, 67, 90, 122, 199; Brown-headed, 137; Red-breasted, 122; White-breasted, 90, 129.

Ocean wanderers, 162.

Oldsquaw, 157, 164.

Orchard, Birds of the, 52, 117.

Oriole, 120; Baltimore, 27, 51, 68, 92; Orchard, 27.

Osprey, see Hawk, Fish.

Oven-bird, 40, 57, 81, 92, 103.

Owl, 88, 93, 135, 144, 151; Barn, 136, 145; Barred, 136, 144; Burrowing, 145; Great gray, 136, 145; Great horned, 69, 90, 136, 144, 148, 151, 217; Hawk, 136, 145; Long-eared, 136, 145, 148; Richardson's, 136, 145; Saw-whet, 136, 146; Screech, 136, 146; Short-eared, 136, 145; Snowy, 131, 136, 145, 151.

Partridge, Spruce, 135.

Pelican, Brown, 90; White, 156.

Permit, 44.

Petrel, 37, 208; Leach's, 157; Wilson's, 163.

Pewee, Wood, 52, 58, 88.

Phalarope, 163; Northern, 163; Red, 163.

Phoebe, 52, 69, 79, 88, 91, 95.

Photographing adults at nest, 189, 190; adults feeding young, 191, 192; colonies, 196; nests, 185, 187; stalking, 200, 206, 208; in trees, 191, 194; young birds, 187.

Photography, developing, 184, 223; enlarging, 232, 234; Expedients in, 195; hints, 183, 184; intensifying, 231; over-exposure, 184; reducing, 233.

Pintail, 160.

Pipit (American), 40, 80, 122.

- Plate-holders, 174.
 Plates, 174, 221, 224.
 Plover, 137, 160; Black-bellied, 162; Golden, 162; Piping, 156, 161; Semipalmated, 162; Upland, 156.
 Positions of birds, 40.
 Prey, Birds of, 141, 151; and poultry, 151.
 Protection, Bird, 21.
 Puffin, 164, 209.

 Quail, 67, 93, 95, 130; Marsh, 117.

 Rail, 94, 156, 158; Clapper, 156; King, 156; Virginia, 156, 158.
 Raptores, see Prey, Birds of.
 Record, Scientific, 44, 45.
 Redhead, 160, 195.
 Redpoll, 131, 133, 135; Hoary, 133.
 Redstart, 44, 59, 71, 88, 104.
 Reduction of photographs, 233.
 Reservations, Protected, 165.
 Residents, 130.
 Ring-neck, see Plover, Semipalmated.
 Robin, 49, 56, 68, 77, 88, 90, 95, 101, 120, 122, 132.

 Sanderling, 161.
 Sandpiper, 160; Least, 158, 161; Red-backed, 157; Semipalmated, 161; Solitary, 157; Spotted, 156; White-rumped, 161.
 Sapsucker, Yellow-bellied, 59, 121.
 Scarcity of birds, 127.
 Schools, Bird study for, 251, 262; Methods of teaching in, 257, 261.
 Scoter, 164.
 Scrub land, Birds in, 54.
 Shearwater, 37, 208; Corey's, 163; Greater, 163; Sooty, 163.
 Shelldrake, 136.
 Shoveller, 160.
 Shore-birds, 18, 156, 160, 162, 209; Resorts for, 162.
 Shrike, Loggerhead, 137; Northern, 131, 134.
 Siskin, Pine, 131, 133.
 Snipe, 137; Wilson's, 122, 158.

Snowflake, 131, 133.

Social bird study, 241, 247.

Songs, 59, 71; Characteristic, 63; Notation of, 66; Resemblances of, 67; Variation of, 70; Write descriptions of, 66, 69.

Sora, 156.

Sparrow, 39, 95, 120; Chipping, 49, 88, 91, 95, 115; English, 50, 90, 130; Field, 50, 54, 68, 71, 79, 91, 95, 101, 115; Fox, 40, 66, 79, 131; Grasshopper, 50; Ipswich, 133; Savannah, 50, 95, 115; Song, 50, 54, 70, 90, 95, 101, 105, 130; Swamp, 56, 70, 79, 91, 95; Tree, 50, 130, 200; Vesper, 50, 69, 79, 91, 95, 115; White-throated, 53, 67, 122, 131.

Squirrel, 146.

Starling, 40; European, 90, 106, 116, 134.

Swallow, 39, 88, 95, 116, 119, 210; Bank, 80; Barn, 53, 80, 91; Eave, 53; Tree, 51, 80, 122.

Swamp, Birds of boggy, 56; Birds of bushy, 55.

Swift, Chimney, 39, 52, 81, 119, 210.

Tanager, Scarlet, 57, 96, 110, 111.

Teal, Blue-winged, 160; Green-winged, 160.

Teeter, see Sandpiper, Spotted.

Tent, Hiding or umbrella, 177, 196.

Tern, 156, 210; Arctic, 157; Black, 157; Common, 157; Least, 157; Roseate, 157.

Thrasher, 40; Brown, 54, 57, 81, 92, 106.

Thrush, 40, 56; Hermit, 53, 57, 80, 131; Louisiana water, 58, 91; Olive-backed, 53, 57, 121; Water, 40, 58, 71; Wilson's, 57, 71, 92, 106, 185; Wood, 57, 71, 92, 106, 189.

Titmouse, Tufted, 137.

Towhee (or Chewink), 81.

Tree-apparatus, 176.

Tripod, 175.

Trips or Expeditions; to Bird Rocks, 165; to Cape Cod, 163, 164; to Cape Sable, N. S., 163, 164; to coast promontories, 164; after sea-ducks, 165; after shore-birds, 162.

Veery, see Thrush, Wilson's.

Vireo, 40, 51; Blue-headed, 121; Red-eyed, 51, 57, 96, 106, 150,

- 189; Warbling, 51; White-eyed, 55, 101, 189; Yellow-throated, 51.
- Vulture, see Buzzard.
- Warbler, 39, 41, 44, 53, 117, 122; Bay-breasted, 44; Black and white, 40, 58, 81, 96; Blackburnian, 88; Blackpoll, 44, 68, 81, 118, 122; Black-throated blue, 58, 122; Black-throated green, 57, 68, 81, 88, 122; Blue-winged, 64, 65, 92, 106, 117; Brewster's, 64; Canadian, 58, 117; Chestnut-sided, 54, 106, 117, 189; Connecticut, 55, 95, 121; Golden-winged, 117; Hooded, 58; Kentucky, 58; Lawrence's, 64; Mourning, 55; Myrtle, 80, 122, 131; Pine, 70; Prairie, 54, 67, 106; Tennessee, 83; Worm-eating, 58, 68; Yellow, 106; Yellow Palm, 80, 122.
- Water-birds, 155, 162.
- Waxwing, Bohemian, 133; Cedar (or Cedar-bird), 40, 52, 69, 77, 79, 120, 130, 132, 133.
- Whip-poor-will, 58, 81, 88.
- Willet, 162.
- Winter birds, 127, 138.
- Woodchuck, 127.
- Woodcock, 77, 79, 88, 90, 93, 106, 122.
- Woodland, 56, 58, 117, 120.
- Woodpecker, 39; American three-toed, 135; Arctic three-toed, 135; Downy, 92, 129, 199; Hairy, 90, 129, 199; Pileated, 59, 135; Red-bellied, 137; Red-headed, 137.
- Wren, Carolina, 137; House, 51, 88, 95; Long-billed marsh, 56, 96, 106, 107; Short-billed marsh, 56, 94; Winter, 71, 122, 131.
- Writing for Publication, 230.
- Yellow-legs, 161; Greater (or winter), 158; Lesser (or summer), 158.
- Yellow-throat (Maryland or Northern), 55, 95, 106, 117.

BY THE SAME AUTHOR

THE SPORT OF BIRD STUDY

Mr. Job is unquestionably one of the best authorities, in his special field, and his present book is a fascinating account of his experiences while hunting with a camera. He writes with enthusiasm; tells entertaining stories of the habits of the birds as he saw them at short range; and has adorned his narrative with a wonderful display of photographs from life, pictures obtained sometimes only after days of patient study of bird life. The book is designed especially for the beginner at the study. One hundred and thirty-four half-tones from photographs. Cloth, octavo. \$2.00 net.

*"One of the most delightful volumes that has come from the publishers, in many a long day."—
The St. Louis Republic.*



OUTING PUBLISHING COMPANY

315 FIFTH AVENUE NEW YORK CITY





UC SOUTHERN REGIONAL LIBRARY FACILITY



A 000 855 794 4

